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I.

WALLING OFF THE SUBARACHNOID SPACES; ITS
APPLICATION TO THE TREATMENT OF CERE-
BRAL AND CEREBELLAR ABSCESS OF
OTITIC ORIGIN, AND, IN A GENERAL
WAY, TO THE SURGERY OF THE
BRAIN.*

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Every endocranial operation comprises three stages:

First stage—From the skin to the outer surface of the dura mater. This is the process of trepanation, properly so called, and is a simple operation, with little risk.

Second stage—From the outer surface of the dura to the cerebral cortex. The easy operation of traversing the meninges is, classically, a simple incision of the membranes, but it becomes an extremely dangerous intervention because of the results which it connotes, such as meningitis and cerebral hernia.

*Translated by A. Miller, M. D.

Third stage—From the encephalic cortex to the point in the cerebrum or cerebellum which it is desired to reach. This is properly an encephalic operation, variable according to the object to be attained—drainage of an abscess, search for a foreign body, removal of a tumor, etc.—always delicate and serious, but of a gravity which cannot be compared to that of the second stage.

In resumé, uncovering the dura mater is of no consequence; it is done often and without danger in the course of a simple mastoid trepanation. Operation on the encephalon is relatively benign; the tolerance of the organ, shown by the harmlessness of exploratory puncture, appears also to be confirmed by the history of many war wounds of the cerebrum and cerebellum. But passing the meningeal barrier is an eminently dangerous thing.

We can say that brain surgery owes its gravity to the existence of the meninges, or, more exactly, to the subarachnoid spaces, by suppressing this, the prognosis becomes very different.

Now, this suppression, this walling off, the surgeon can obtain and profit thereby either by producing it (induced exclusion) or by utilizing preformed adhesions (spontaneous exclusion).

Induced Exclusion.—The surgeon may, at the chosen point, transform the meninges into a fibrous coat in the following manner:

For clarity of exposition and because of the frequency of the condition, let us suppose that we are dealing with an encephalic collection of otitic origin, which we propose to find and treat.

The meninges being exposed, we employ the following technic: In no case and under no pretext do we cut the meninges nor use the scalpel. A stout Pravaz needle, a grooved director, a small forceps with smooth jaws (the angled forceps of the otologist, for example) and a filiform drain constitute our entire surgical equipment.

The Pravaz needle is pushed through the meninges and into the brain in the supposed vicinity of the collection. When a drop of pus escapes through the needle, indicating that its point is in the abscess, the needle is replaced by a grooved

director introduced along the needle and thus slightly enlarging the opening. Most often pus appears in the groove and the abscess is thus partially evacuated. A drain of very small caliber, almost filiform, is then introduced, with the bent forceps mentioned, along the channel of the director and without tearing the meningeal breach. It is not necessary to fasten the drain, for, contrary to what happens in most drainage cases, it is never expelled. The drain is left in place twenty-four to forty-eight hours. In time it acts, not as a drain, but as an irritating foreign body, tending to create meningeal adhesions. In fact, the meninges about it are changed to a fibrous covering, as we have found constantly in the five cured cases later described and carefully examined at autopsy.

Next day, or on the second day after, at the first dressing the opening may be enlarged. This can be done in different ways: a drain slightly larger than the first can be introduced, or, with a very fine bistoury, the fibrous ring about the drain can be incised for one or two millimeters, carefully avoiding going beyond the transformed area in the meninges. Into the breach thus made, which, let it be repeated, must not go outside the fibrous thickening, a drain of desired caliber is then introduced. The latter then begins to play its rôle, not only of drainage but also that of a foreign irritant about which and for some distance away the meninges undergo a fibrous change. Every day, for upwards of a week, the dressing is repeated in the same manner. A drain of larger and larger size is put in, which enlarges the meningeal opening, increases the fibrous area and thus gradually removes the arachnoid spaces from the drainage channel.

When the channel measures six or seven millimeters in diameter the patient can be considered well on the way to cure. There remains only to watch the drainage of the abscess.¹

By this technic we avoid the two great complications, both frequent and dangerous, which we nearly always have after incision of the meninges, namely, meningitis and hernia. Meningitis is prevented by the same process by which general peritonitis is averted in a case of appendicular abscess. The pus from a brain abscess is drained without invading the

meninges the same as the pus from the appendix has been drained without involving the peritoneum. Walling off the arachnoid spaces is like walling off the greater peritoneal cavity, excepting, of course, that the exclusion of the peritoneum is spontaneous while that of the meninges is induced.

As to cerebral or cerebellar hernia, it cannot ensue, because the brain, instead of finding an opening, meets a barrier, and that a reinforced one.

A patient with a cerebellar abscess treated in this way, who died of a second cerebellar abscess developing after the first was progressing to a cure, has furnished us with proof. In this case at autopsy the existence was clearly shown of a dense, resistant ring about the drain, and beyond the ring the microscope revealed nothing.

Following are five cases of brain abscess of otitic origin which we have treated by this method, all of which resulted in a cure. In the first, which is described in detail, there was a cerebellar abscess resulting from a suppurating otitis media of traumatic origin, and the operative technic described was employed. The patient was also looked after from a neurologic viewpoint by my friend, Tournay, and it is intended to present the case before the Neurologic Society. The four other cases, given in brief, were at the Lariboisiere, where I had the honor of substituting for my chief, Dr. Sebileau.

CASE 1.—CEREBELLAR ABSCESS DUE TO TRAUMATIC SUPPURATIVE

OTITIS MEDIA—CURE.

The patient, Private B. C., of the 104th Inf., was wounded November 5, 1916, at Douaumont by a shell bursting fifty meters to his right, producing a tympanic rupture. Middle ear suppuration followed, then mastoiditis, for which a trepanation was done December 5th. On January 14, 1917, he came to the otolaryngologic center at Vichy, with the following notation: "Copious suppuration from the mastoid wound; osteitis of the antrum." On February 4th I was called in consultation by the chief of the center, Chouquet, who suspected a brain lesion because of the following symptoms: Headache, vomiting, slight cerebral torpor, papillary stasis, pulse 50 to 60, temperature varying from 37.7° to 38.2° C., exaggerated reflexes, especially on the right (the side of the presumed lesion), plantar reflex marked in extension, nystag-

mus on looking obliquely, and slight vertigo. When asked to touch the tip of his nose with his index finger he did not execute the movement properly with his right hand. So-called "marionette" movements were also difficult for the right hand. With these symptoms present, I confirmed the diagnosis of a brain collection and thought of a cerebellar abscess.

Operation was done the same day and following are the notes: The bone lesions were very extensive, necessitating resection of the antral roof and exposing the sinus in its entire vertical portion as well as the brain in front of and behind the sinus. Three punctures with the Pravaz syringe were made posterior to the sinus. The first, pushed to a depth of 3.5 centimeters, brought only thick, reddish cerebrospinal fluid. Another puncture of the cerebrum resulted only in fluid of a very slightly altered appearance. Again the cerebellum was punctured, but this time in front of the sinus. The needle had hardly penetrated to 2.5 centimeters depth when a drop of pus came from the free end.

Through the puncture an aurist's forceps with smooth jaws slightly opened was then introduced, permitting the evacuation of a liquor glass full of clear reddish yellow pus.

A very small drain was passed with slight difficulty through the meningeal opening immediately in front of the lateral sinus.

Bacteriologic examination of the pus by Dr. Demoulières gave the following:

Fluid from the cerebral puncture, sterile. Fluid from the cerebellar punctures, in front of and behind the sinus, streptococci in pure culture.

First dressing February 6th. Dressing removed with escape of a spoonful of reddish purulent fluid under pressure. A drain of slightly larger caliber was introduced with great difficulty.

Neurologic examination by Dr. Tournay: Tendon reflexes of lower limbs slightly greater on right, especially the patellar. Extension of the big toe to the right. Fibrillary twitching on the right. Upper limbs: Dyssymmetry of right arm.

February 7th, second dressing: Immediately on removing the drain reddish fluid, then frank pus issued from the cavity. Insertion of a slightly larger drain. The meninges about

the drain did not yet show any tendency to fibrosis. However, there was no meningeal reaction nor any tendency to hernia. The vomiting, which disappeared after operation, has given place to a slight nausea.

February 8th, third dressing: The size of the drain was slightly increased.

February 9th: The ordinary rubber drain was replaced by a fenestrated hard rubber drain specially made in the prosthetic laboratory by Dr. Bennajeant.

Neurologic examination: No change since the previous examination, although it is evident that the right forearm reflex is stronger than the left. Babinski's sign is marked. The right hypermetria is easily demonstrated both for the upper and lower limbs. When commanded to touch the tip of his nose with his index finger the patient quickly points to his left eye, passes beyond the root of the nose, then slowing his movement with evident effort he finally and hesitatingly touches the nasal tip. Likewise when told to put his right heel quickly on his left knee he carries it up to the anterior surface of the thigh to a hand's breadth below the hip joint, then slowing his movement in a second effort he brings his heel to the knee.

In the "index test," when the patient executes horizontal movements, he shows a marked tendency to spontaneous deviation downward. This deviation is not seen on movement in the sagittal or frontal plane.

February 10th, fifth dressing: The vulcanite drain has been well borne. After cleansing, it is replaced and pushed in deeper, allowing thick yellowish pus to escape. There was probably a still deeper collection which the drain thus reached and permitted to evacuate.

February 11th, sixth dressing: Locally, the appearance of the wound is very satisfactory. The fibrous, meningeal, walling off ring is perfectly established. However, the headache and vomiting have reappeared.

February 12th, seventh dressing: Contact of the drain with the anterior wall of the sinus has undoubtedly caused an erosion of the latter. Extraction of the drain caused a copious hemorrhage. The sinus was tamponed, no drain.

Neurologic examination showed no change of symptoms, save in the "index test." When the right upper arm performed movements in the horizontal plane the index deviated downward, as in the preceding test, the deviation amounting to 25 centimeters. Moreover, in movements in the sagittal plane the finger deviated to the right, which it did not do in the previous trial, the deviation being 25 centimeters. There was never any deviation in the frontal plane.

February 15th, 16th and 17th, tenth, eleventh and twelfth dressings: Local conditions quite satisfactory. Drainage perfect. The mastoid wound shows a tendency to fill too rapidly, and a compressing dressing was applied to it. The patient declares that on certain efforts, in particular when he attempts to pass gas, he feels vertiginous sensations; seeming to him as though he were turned on his feet like the hands of a watch, the left shoulder being carried forward.

February 18th, 19th, 20th, thirteenth, fourteenth and fifteenth dressings: The granulation of the abscess cavity tends to expel the drain. The latter is replaced by another vulcanite tube, shorter but longer. The general condition is good. Only the vomiting persists and this seems to be due to irritation of the vestibular passage (Deiter's nucleus) rather than to the cerebellar abscess itself.

Neurologic examination indicates an attenuation of the signs of pyramid irritaion (tremor) and certain cerebellar symptoms. The index test in the vertical plane with the entire arm still shows deviation downward of 25 centimeters. But there is no deviation when he uses only his hand. Besides, there is no deviation in the horizontal plane. Nystagmus, on the contrary, is more marked. The oculocardiac reflex is slightly exaggerated (22 to 50).

February 26th, daily dressing is continued: Suppuration has diminished considerably. Granulation has reduced the length of the drain to 1/5 centimeter, but not its caliber. No vomiting for two days. General condition excellent. Neurologic examination shows change. Reflexes are almost normal. Plantar irritation sometimes, but not always, elicits extension. As to the cerebellar symptoms, they are reduced to a slight vertigo.

March 5th. No dressing for thirty-six hours. The drain has been expelled. Only a simple mastoid dressing is applied, but taking care to put the end of the wick in the little cavity of the meningeal layer, the granulation of which is fusing with the granulation of the mastoid wound.

March 16th. Curettage of the exuberant granulations of the mastoid which tend to hide the deeper granulations over the cerebellum. The cerebral cavity is entirely filled.

HEARING TESTS.

Right		Left
0.4	Voice	2. M.
0.12	Whisper	0.25
Contact		0.05
<hr/>		
0.20	Watch	0.20
Positive	Rinné	Positive
.....	Weber	Lateralized
Markedly diminished	Schwabach	Diminished

VESTIBULAR TESTS.

Nystagmus caloric reflex (water at about 20 degrees C.), normal on both sides.

Rotary nystagmus reflex (10 turns in 20 seconds) abolished on the right, normal on the left. Voltaic vertigo: Positive on the right, beginning of inclination at 4 m. a. Positive on the left with backward traction at 10 m. a.

April 22d. Both from the general and local viewpoints the patient may be considered cured. He is sent on for convalescence.

February 20, 1918. Twelve and a half months after operation he shows no pathologic signs other than slight intermittent headache, tinnitus in the right ear, with marked diminution of hearing on this side, and abolition of the right rotatory nystagmus reflex, while the caloric reflex is retained. Private B. was then recommended for the Auxiliary Service.

CASE II.—ABSCCESS OF RIGHT TEMPORAL LOBE FOLLOWING CHRONIC OTORRHEA. RECOVERY.

This was a woman, Eugenia M., aged 26. August 15, 1911, she was admitted to the service of Dr. Sebileau, whom I re-

placed. She was in coma and her history, taken previously, was as follows:

Anamnesis: Chronic (?) otorrhea dating from infancy, recurring three years ago, subsiding, then recurring again four weeks ago. About July 20th the patient, who was near the end of pregnancy, began to have extremely violent headache. The headache, which was temporal and bilateral, did not respond to analgesics and was so severe that it prevented sleep. Accouchment of her child, a healthy full term boy, took place July 31, spontaneously and normally. August 11, the patient left the midwife's sanitarium and went home. The headache, which had never ceased to be violent during this period, increased still more. August 15 the patient, in coma, was taken to the Lariboisiere.

Symptoms on entry: On the morning of the 16th when I examined her the coma was absolute. There was a marked deviation of the head and eyes to the left, contraction of all four limbs, distinct exaggeration of all the reflexes and fibrillary twitching of the right arm. Respiration was stertorous and the tongue dry. The pulse was slow (60), but varied from moment to moment. Temperature 38°. No reaction of a meningeal character, except the Kernig sign. Lumbar puncture showed numerous polynuclears and a few lymphocytes but no microbes in the fluid. Immediate intervention was determined upon.

Operation.—Under chloroform anesthesia a classic opening of the petromastoid was made. In the vicinity of the antral roof and the tympanic cavity at least two centimeters of the dura mater was covered with granulations. With the Pravaz needle the temporal lobe was punctured immediately, causing an issue of fetid yellowish serous pus; on being examined it was found to contain many cocci—staphylococci and some chains of streptococci. The grooved director was introduced into the meningeal wound and the pus flowed through the groove. Then a small drain replaced the director. No plastic. Dressing with gauze and zinc peroxid. The pulse, which was 55 at the beginning of the operation, rose to 94 after, but the patient remained in coma for 18 hours.

Operative Results.—On the evening of August 17 the pa-

tient responded to questions and insistently demanded food and drink.

August 18 (24 hours after operation) the cerebral condition was normal and her lucidity was such that the anamnesis above related was obtained. Contractures had disappeared and the limbs were supple, only a slight stiffness of the neck remaining. Violent frontal headache was complained of by the patient. From this time on dressings were changed daily. For a week the size of the drain was increased a little every day in order to increase the meningeal breach gently and progressively; its borders took on a fibrous consistency on the fourth day.

For three weeks variations of temperature and pulse were noted. Changes in her general condition were in proportion to the greater or lesser efficiency of the drainage. Every time that we attempted to abolish the drain the temperature mounted, the pulse slowed, and the headache reappeared.

September 9, the flow having ceased and the cavity being partially filled, the drain was discontinued. Her condition was such that she began to sit up.

September 21, a plastic was done under chloroform. Thereafter the dressing was applied through the canal.

November 15 she left the hospital, having had no complication other than a mild chondritis due to bacillus pyocyaneus.

February 24, after 43 dressings, the wound was completely epidermized.

For a period of two years I saw the patient from time to time. During this time she had three attacks with the following symptoms: Violent headache for two or three days, then for 24 to 36 hours a continuous discharge of cephalorachidian fluid which apparently came from the old meningeal wound, then a sudden stoppage of the discharge and return to normal.

CASE III.—ABSCCESS OF THE TEMPORAL LOBE FOLLOWING ACUTE

OTITIS MEDIA. RECOVERY.

Mme. T. H., aged 25, entered the Lariboisiere November 2, 1911. She was four months pregnant. No previous history. Questioning the patient was difficult, however she made it understood that for a fortnight she had suffered with her left ear, having tinnitus and deafness, and for about a week

her ear had been suppurating. It was also learned from her story that for several days preceding admission she had been stuporous, the hebétude going on to attacks of mild delirium, although between attacks she recognized persons and things without being able to name them. In addition there were frequent vomiting, very intense, left hemicrania and persistent insomnia. The hemicrania necessitated topical applications, effects of which, such as blisters and crusts, could be observed on the left frontal and temporal regions.

These phenomena have rather lessened during the past three days; the headache has become less intense and the hebétude less marked. November 2, when examined on entry, she showed marked mental trouble. She manifested both cerebral stupor and paraphasia. Either she gave a meaningless name to things that were shown her or she erred in their appellation. Most objects she called "plate" (*assiette*) and realizing that she was wrong, grew impatient. If the object was named for her, she repeated the word but by her manner showed her doubt of the name announced. There was no verbal deafness. On the other hand, there was a slight dysgraphia; she wrote at dictation with numerous errors and soon stopped, showing great fatigue. The word-blindness was more evident; in copying a text she made many mistakes and changed the words until they were unrecognizable. She spelled fairly well but read with greater difficulty.

Reflexes: The right patellar reflex was plainly exaggerated, and the Babinsky positive on this side. No signs of meningeal reaction.

As to the eyes, the pupils were normal, no nystagmus, no motor paralysis, fundus not examined.

Locally there was a slight discharge of thick pus from the ear. The posterosuperior canal wall was bulged so that the drum membrane could not be seen. No external changes over the mastoid; it was tender to pressure, especially over the antrum. Percussion was painful in this region, also in the frontal and temporoparietal regions. Temperature, 38.2° C.; pulse, 80; respiration, normal; no albuminuria.

Operation, November 4.—Classic mastoid trepanation. Pus under tension was found in the antrum. There was a marked osteitis about the canal of the facial, which was almost totally

destroyed, of the tip, which was resected, and of the antral roof, which no longer existed. At this latter point the dura was red and granulating. During the night following the operation the patient had two attacks of Jacksonian epilepsy.

November 5. The patient was very restless, the cerebral symptoms were more marked, and it was decided to go through the meninges. Near where the antral roof had been the opening through the bone was enlarged and with the Pravaz needle three punctures were made in the cerebrum. The one farthest anterior, which corresponded to the anterior portion of the sphenotemporal lobe, under slight pressure brought some very fetid brownish pus. The grooved director was introduced in the meningeal wound, distending it. Pus came out the groove. Then the director was replaced by a filiform drain 3 c. m. long. In the evening the temperature remained high (40° C.), the patient was delirious and the facial expression was changed. November 6 the temperature was 37° C., the general condition was less disquieting and the patient spoke. From this time on the cerebral phenomena and general symptoms diminished and rapidly disappeared. For two weeks the dressing was changed every day. At the beginning the drain was changed daily and increased in size until it reached a caliber of 25. A few times the cavity was lavaged with boiled water with a little hydrogen dioxid added. Little by little the drain was shortened without changing its diameter, and on February 17, after 29 dressings, the patient, who had long before left the hospital, was well. I saw her six months afterward. Her accouchment had taken place normally.

CASE IV.—ABSCCESS OF LEFT FRONTAL LOBE OF OTITIC ORIGIN.
RECOVERY.

A young man of 37, a government representative, in the course of an acute suppurative otitis, developed an abscess of the left sphenotemporal lobe.

During the early period of the trouble its evolution was that of a simple mastoiditis, and only one symptom, persistent headache, aroused fear of a complication.

In the second period, which began three weeks after mastoid trepanation, two groups of symptoms appeared. In one group there were slight signs of meningeal reaction—stiffness

of the neck, Kernig—and in the other there were signs of involvement of the left temporal lobe—paraphasia and word-blindness. Papillary stasis directed the diagnosis plainly to an encephalic collection.

Operation was performed as in the preceding case, applying in still more systematic fashion the method described of walling off the meninges. It should be noted that the abscess was superficial, its internal limit being 3.5 cm. from the cortex and its external wall only 6 or 7 cm. from the meninges. This condition explains the very slight signs of meningeal reaction observed and the aseptic character of the cerebrospinal fluid. Cure took place in five weeks, dating from the second operation, by granulation of the abscess cavity and mastoid wound. Contrary to the preceding case, the paraphasia went away very slowly, being the last symptom to disappear.

CASE V.—ABSCCESS OF RIGHT TEMPORAL LOBE FOLLOWING
CHRONIC RECURRING OTORRHEA. CURE.

(Résumé of a report to the Surgical Society, December 16, 1912, by Sebileau.)

The patient, a young farm laborer, aged 20, having chronic otorrhea with recurring suppuration, entered the Lariboisière with the following symptoms: Old right otorrhea, with abundant and very fetid suppuration, slight mastoid reaction, headache, vomiting, slowing of pulse and slight fever.

Operation was done in two stages. On opening the mastoid there was found an osteitis of the antral roof. After this the symptoms persisted except that the headache was less. The abscess was found by exploration with the Pravaz needle introduced through what had been the roof of the antrum into the right temporal lobe. At a depth of 3.5 cm. a brownish, somewhat thick fluid escaped, which on bacteriologic examination showed the presence of bacillus pyocyaneus. A drain 1 mm. in diameter and 4 cm. long was introduced.

Operative Results.—No meningeal reaction, no tendency to hernia. The pus was evacuated through hard rubber fenestrated drains with progressively increasing caliber. The cerebral abscess healed in four weeks without any sequelæ. The wound, on which a secondary plastic was done, was cicatrized in three and a half months.

Six months after leaving the hospital the patient wrote from St. Quentin, where he resided, that nothing in his condition recalled his former trouble.

CEREBRAL COLLECTIONS FOLLOWING WAR WOUNDS.

This method of walling off the subarachnoid spaces for brain abscesses of otitic origin I have also applied to cerebral collections following war wounds.

For the moment we shall discuss the purely encephalic closed collections and not those with fistulæ and meningeal changes.

In such cases we proceed exactly as in brain abscess originating from the ear. The same technic gives the same results. But here there is a new element—spicules, bits of clothing or various foreign bodies enclosed in the abscess cavity or near it. These tend to provoke exacerbations or recurrences. They modify both the method of drainage and the eventual prognosis, because they are capable of causing the death of an apparently cured patient. In spite of all this, the principle of walling off the subarachnoid spaces remains absolute, since it always averts meningitis and hernia of the brain.

For example, here in the case of a cerebellar abscess in which the patient left our service perfectly cicatrized and apparently normal, yet died, it appears, five or six months after the operation of an unknown affection, no doubt a recurrence.

CASE VI.—ABSCCESS OF CEREBELLUM OF TRAUMATIC ORIGIN.

Private D. was wounded at Hill 304, May 27, 1916, by a bursting shell, near the right occipital region. The projectile was extracted in the ambulance. During the following days the patient showed marked agitation; lumbar puncture yielded hemolyzed fluid.

June 4 trepanation showed that there was a depression of the skull for about 2 cm. in the inferior occipital region near the median line. Some spiculæ were extracted and, the dura mater being adjudged intact, the operator used only a gauze drain. Soon there appeared vomiting of water and bile, considered to be of gastric rather than cerebral origin.

June 30, the wounded man arrived at the Otorhinolaryngologic Center. At this time and for six weeks he had no symptoms

on which a precise diagnosis could be made. There were only a slowing of the pulse to 55, infrequent vomiting with no particular character, a state of depression rather than somnolence, and vertigo which obliged the patient to stay in bed. About August 20 the symptoms became more definite; the vomiting was more frequent, the occipital headache was paroxysmal, the pulse, always slow, especially when the patient slept, became small, frequent and filiform when he performed any movements.

This condition continued until September 15. On that date there was an exaggeration of the reflexes, mild on the left, marked on the right. The right side showed clonus and Babinski. No nystagmus, no adiadococynesis. Examination of the oculæ fundi indicated bilateral papillary stasis.

Operation, September 18: Occipitonuchal incision, in the path of the original cut. The trepanation opening was enlarged. The dura mater showed adhesions to the integument in the trephined area and to the bone in its lower portion. Attempt was made to separate the adhesions from the cerebellum, and this seemed to cause a marked bulging of the cerebellum. A Pravaz needle introduced into this bulge brought a teaspoonful of yellowish pus which microscopically showed streptococci. A very small sized drain was introduced through the meningeal breach to a depth of 3 cm. An opening was made in the skin covering to correspond with the opening in the bone, in order to permit drainage and observation of the wound.

Operative Results.—Almost immediately there was a disappearance of the vomiting, diminution of the headache and return of the reflexes to normal. The caliber of the drain was increased after the first dressing and its length was lessened after the twelfth dressing. The existence of the fibrous exclusion ring was noted on the fourth day. At no time was any tendency to hernia noted. In the first days the drain did not drain; it simply performed its work of exclusion, and the pus was evacuated each morning on withdrawing the drain. A cotton carrier put in to a depth of 3.5 c. m. brought out the pus which was not spontaneously expelled.

October 10, the patient was able to get up. November 28 the drain was abolished. December 15, the wound was com-

pletely cicatrized. March 30, the patient showed no symptoms other than a slight exaggeration of the rotation reflex. He was considered cured and sent to convalescence.

We learned in June that he had died suddenly.

FOREIGN BODIES IN THE BRAIN.

Finally, with regard to artificial walling off of the sub-arachnoid spaces, I would say that this method applies to the extraction of war projectiles from the brain, whether the extraction be through healthy meninges or meninges that have regained a normal appearance objectively. Removal of the projectile is done in two stages: the first or preparatory stage being the walling off, and the second being the extraction proper through the walled off membranes.

CASE VII.—BIT OF SHELL, ONE CENTIMETER SQUARE IN THE RIGHT CEREBRAL HEMISPHERE THREE YEARS; EPILEPTIFORM CRISES. REMOVAL AFTER WALLING OFF THE MENINGES. RECOVERY.

Private G. P., of the 159th Regt., Infantry, was wounded September 10, 1914, by a bursting shell. A double trepanation was done, one over the posterior, the other over the inferior portion of the left parietal region, but the foreign body was not extracted.

In May, 1915, the patient, whose wound had healed, but who had epileptiform crises was discharged.

April 27, 1918, the epileptiform crises had become increasingly frequent and he was hospitalized at the Vichy neurologic center.

Examination: Headache, right hemiparesis, with exaggeration of reflexes, right plantar extension reflex, frequent attacks of Jacksonian epilepsy. By radiography the projectile was localized not far from the upper end of the Rolandic area and its extraction advised.

First operation, April 30, 1918, for exclusion of the sub-arachnoid spaces. Under local anesthesia with adrenaized novocain, 1/200, the anterior superior trepanation was enlarged with bone forceps. In this region the meninges appeared to be covered with a thin layer of fibrous tissue, but at the periphery where they were freshly exposed they appeared

normal. With a fine trocar the meninges were punctured, and under the guidance of the fluoroscopic screen the instrument was directed toward the projectile. It should be stated that the insertion was made slightly below the foreign body to avoid the lateral sinus and slightly behind to avoid the upper part of the Rolandic zone, making the path of the trocar somewhat oblique. The trocar was replaced by a 3 mm. drain.

April 5. Drain of 5 mm. inserted.

April 7. A fibrous ring is seen about the drain, whose caliber is now 7 m. m.

April 8. Drain of 8 mm. diameter. Meningeal changes about the drain are very plain.

April 9. Drain of 9 mm.

April 11. Second Operation.—Local anesthesia; intermittent employment of fluoroscope. A metal tube, specially made in my workshop, was introduced through the meningeal opening. The tube thus served actually as an encephaloscope. Dr. Surrel, who managed the fluoroscope, announced the relations between the end of the tube and the missile. I attained contact with the projectile after breaking a path and making a real endoscopy of the brain by means of a head mirror.

Nevertheless I did not discover the projectile at the moment when Dr. Surrel stated that the tube was in contact with it, because there was a capsule surrounding the projectile sufficiently dense to hide it from plain view but thin enough to locate it by the transparency on closer examination. The capsule was broken by a cotton carrier, and under direct vision the foreign body could be moved slightly. Then with a foreign body forceps from our bronchoesophagoscopic kit I seized the missile and brought it out together with the encephaloscope.

The operative results were simply those of a cerebral abscess with scanty thin pus, containing staphylococci and a few tetragenes; healing occurred in five weeks.

Cicatrization was accomplished by granulations that expelled the drain which was slowly shortened but increased in caliber.

It should be stated that during the first five or six dressings the insertion and extraction of the drain and especially the introduction of a cotton carrier, produced limited epileptic crises

without loss of consciousness the same as he had had and feared before, following the same modality but not with as great intensity. On the right there would be clonic contraction, then successively tonic contraction of the finger, hand, all of the upper limb, finally of the face, and sometimes also the leg. Twice the attack was generalized and was then accompanied by loss of consciousness. Each time the pupils dilated considerably just before the attack began.

June 5, the patient was sent out. The wound was well cicatrized. Since extraction of the projectile there had been no epileptic attacks except those produced by the act of dressing. A little headache and left hemiparesis persisted.

CASE VIII.—FOREIGN BODY IN THE LEFT FRONTAL LOBE DUE TO A BURSTING AIR SHELL. DEATH.

M. R., of the 53rd Regt. Colonial Infantry, was wounded October 1, 1917, at Ravigny. He was admitted to the Center October 12, and presented a penetrating wound immediately above the right zygomatic arch, into which the probe penetrated 8 c. m. on directing it toward the top of the orbit. At this point the probe discovered denuded bone, moreover a radiograph indicated the presence of a metallic body 6 or 7 mm. square behind the left frontal sinus in the area of the left frontal lobe.

Ophthalmologic Examination.—O. S.: Almost complete ophthalmoplegia. Pupil immobile in mydriasis. Vessels and papilla apparently normal. Macular hemorrhage. Vision = light perception. O. D.: Normal.

Neurologic examination: Negative.

October 15. Operation with the object of walling off the meninges which would ultimately permit extraction of the projectile. This was done under fluoroscopic control. When the frontal sinus was trephined and its posterior wall removed the meninges seemed objectively normal. The fluoroscopic screen showed that the projectile was situated 4 or 5 mm. internal to the meninges as indicated by a probe placed in contact with them. The meninges and brain were punctured with a fine trocar. The screen showed contact of the trocar with the foreign body at the same time that the operator felt metallic contact.

A small drain was introduced into the punctured opening. October 17, the drain was removed, followed by the escape of cerebrospinal fluid; it seemed that adhesions had not been set up. A drain of 3 m. m. diameter replaced its predecessor. October 19, there was no escape of fluid on taking out the drain. This time the meninges seemed to have reacted and a drain of 5 mm. was put in with difficulty. October 21, a fibrous ring was plainly in evidence; drain of 7 mm. October 23, second operation, extraction of the projectile. This was done under local anesthesia with screen control. The projectile was brought out to the meningeal opening with a curette and seized with a forceps. Accompanying it was a scale of bone from the entry wound which had been carried in by the missile.

Operative Results.—For three days the local evolution was normal, the meninges organized in the usual way. October 27, fever appeared, with slight delirium and signs of encephalitis. These symptoms continued to aggravate and the discordance between the local and general conditions was striking. November 21 the patient died. Autopsy showed a frank circumscribed encephalitis and meningitis of the right hemisphere almost exclusively, the left frontal lobe, on the contrary, presenting a cerebral wound in process of granulation with normal meningeal adhesions about the drain. To sum up, the patient died of right cerebral lesions developed from the wound of entry and the first part of its intrahemispheric path.

SPONTANEOUS EXCLUSION.

By way of summary, what do we accomplish by inducing a subarachnoid walling off? Simply that we obtain at will the course usual in a septic meningitis progressing to a cure and ending in a subarachnoid exclusion. The conception of this spontaneous exclusion I have acquired from the practice of otology. An old principle of aurists demands that the procedure in the course of operation for mastoiditis complicated with intracranial lesions shall follow the path of infection—"follow up the lesions," as they say. Now we should remember that, however empirical this principle may seem, it has been demonstrated by experience as being perfectly valid. In fact, it

is undeniable that an abscess of the temporosphenoidal lobe heals more often when it is opened by way of the tegmen tympani or antral roof than when it is attacked through the temporal fossa. No doubt it is because by following the former path we go through meninges which though of course not completely excluded have nevertheless formed some adhesions, while in following the temporal route we attack normal meninges, without defensive organization, and thus are taken at a disadvantage. But these considerations are somewhat theoretical and consist partly of hypothesis. The example furnished by the shirt button abscess, "*en bouton de chemise*," is even more convincing. The literature reports some cases of brain abscess which eventually drained themselves externally. It is logical to suppose that in these cases the pus could not have been evacuated except through meninges organized against the infection. Moreover, in a case of this sort I have just verified anatomically the correctness of this assertion; at autopsy I found an old cerebral abscess emptying into a mastoid (which was itself fistulous) through a meningeal breach the circumference of which constituted an actual fibrous ring.

Here then are positive facts gathered from war surgery which bring support to our theory and I think have striking value. War surgery has allowed us to observe many cases of brain wounds proving that every meningeal injury, if the evolution of an infectious process is not too overwhelming, reacts by forming adhesions which completely exclude the subarachnoid spaces.

These facts are noted in: Traumatic cerebral collections. Foreign bodies in the brain. Brain wounds with or without hernia.

CEREBRAL COLLECTIONS FOLLOWING WAR WOUNDS.

When the brain is injured by a projectile it is most often accompanied by foreign substances, such as spicules from the cranial vault, bits of clothing, hair, etc., which cause suppuration. Certainly, it is possible for the meninges to cicatrize normally and the cerebral collection thus to be closed. We have beheld such an instance as described previously and have

shown that in treating this kind of suppuration it is necessary first to exclude the subarachnoid spaces.

But most often the meninges do not close; they organize and we have a fistulous cerebral abscess; actually a "shirt button abscess" has thus been created.

Following are three cases of this sort in which new formed adhesions existed about the fistula; the adhesions being scrupulously respected were reinforced and extended by the employment of a sufficiently large drain just the same as in artificial exclusion. In this way the case becomes similar in all respects to one of artificial walling off and the same technic is applied.

In the first case the fibrous exclusion ring was perfectly recognizable. In the third case it should be mentioned among other things that when we operated, the meninges, which had been widely opened by the projectile, had not undergone the fibrous process and consequently did not occasion sufficient resistance to the outward push of the brain. The cerebral hernia became more accentuated up to the moment that the drain provoked fibrous changes; after the formation of this barrier the hernia persisted but did not increase.

The second case is no less striking in respect of the production of a fibrous ring. When by the employment of drains graduated in caliber the diameter of the ring became sufficiently large, two or three spicules of bone came out of the abscess cavity. Eventually it was necessary to take out two more which were deeply situated. After their extraction the wound cicatrized normally.

CASE IX.—FISTULOUS CEREBRAL ABSCESS OF TRAUMATIC ORIGIN,
PROGRESSING TOWARD RECOVERY.

Corporal C. M. was wounded June 16, 1918, by an air bomb at Oguon. He sustained a small cranial wound and a large wound in the masseteric region with a Y-shaped fracture of the lower jaw on the left side. The latter received most attention. However, on September 21, the cranial wound not cicatrizing and suppuration persisting, the fistula was explored. Nothing abnormal was found. The bone did not seem necrotic and the meninges seemed healthy; the edges of the skin wound were excised and the wound sutured.

October 22, the patient was shown to me. I noted simply a rather abundant suppuration from the fistula which had recurred and a headache which varied according to the purulent discharge. Neurologic examination revealed neither motor nor sensory trouble of cerebral origin; patellar and Achilles reflexes equal, plantar flexion; pupils equal with normal reaction; visual field normal; fundus normal.

October 23, operation. Local anesthesia with adrenalized novocain, 1/200. Exploration of the fistulous tract after making a circular flap over the frontotemporal region and detaching some anterior fibers of the temporal muscle. There were found:

1. Fungosities in the bony opening (size of 50 centime piece) produced by the traumatism.

2. After enlarging the opening, the existence of a small meningeal track about which adhesions had formed, thus accomplishing a spontaneous exclusion of the meningeal cavity.

3. A pocket of pus with its bottom 4 cm. from the cortex. A drain of small size was introduced forcibly into the fistula; it served both for drainage and for the walling off process.

An opening was made in the center of the flap, which was then put in place and sutured.

October 25, the point had been gradually reached where it became possible to introduce a drain of 8 mm. diameter. Headache had disappeared. No longer was there any pus retention, the cerebral pulsation, which was well marked, having aided in evacuating the collection.

November 13, examination of the cavity with the encephaloscope showed that it was beginning to fill by granulation.

December 10, progress was slow but normal. The pus was less and less abundant, and the drains, though slightly augmented in caliber, were progressively shortened.

CASE X.—PENETRATING WOUND OF THE RIGHT FRONTOPIRIETAL REGION; FISTULOUS ABSCESS, RECURRING BECAUSE OF SPICULAE; RECOVERY.

Adjutant V. was wounded by a shell May 17, 1916, at Hill 304. He was trephined May 19 for a "penetrating wound of the skull with tearing of the meninges and escape of brain

substance." He arrived at the Royat Center June 13, 1916. On admission he complained of intermittent headache and vertigo. The operation wound had healed save in its lower portion, where there was fairly abundant pus. During the following days the headache and vertigo increased in intensity and the suppuration was greater. There were noted papillary stasis, exaggeration of the Achilles and patellar reflexes on the left, and Babinski on this side. Radiography showed a projectile 3 or 4 millimeters in size, situated near the internal aspect of the right hemisphere, quite near the median line, at the intersection of a vertical line through the middle of the sella turcica and a horizontal line joining the superciliary ridges.

Operation, July 11. Curvilinear incision tracing the one made at the first operation. The meninges seemed to be covered with fungous granulations which were curetted. At the center of the denuded area was a loss of substance, through which pus came from the depths, and through which there must have been an escape of brain matter. It was noted that the rounded opening, which had a diameter of 3 or 4 mm., was surrounded by a very resistant fibrous ring. A drain 3.5 cm. long was introduced through the ring. A fenestrum was made in the skin flap and the latter was sutured.

August 15, the wound was pretty well cicatrized, but a small fistulous orifice persisted through which a drop of pus welled out of mornings.

August 27. For two days the headache had been more violent and the purulent discharge more abundant. In the dressing were found two spicules, measuring respectively, $1\frac{1}{2}$ and 2 mm. in length. Careful sounding of the sinus revealed another large and only slightly mobile spicule at the bottom.

September 12 at 7 a. m., there was an attack of aphasia and agraphia lasting about 10 minutes, with slight foam on the lips and not accompanied by loss of consciousness. The same day at noon there was another crisis of aphasia and agraphia, this time with loss of consciousness. (It should be noted that the patient is left handed in reflex acts.) September 16 occurred a typical attack of Jacksonian epilepsy, involving the face, left arm and left thigh. The duration of the attack was three hours, with convulsions lasting ten minutes. In the even-

ing there was impairment of speech without actual aphasia. Exaggerated reflexes and Babinski on the left side.

September 19. No renewal of the attacks, but there was a constant slight interference with speech. Marked papillary stasis on both sides. On exploration of the fistula the spicule could be felt at a depth of 4 or 5 cm.

Second operation, September 21. Vertical incision. A forceps introduced into the fistulous track enabled appreciation of the resistance of the meningeal ring. With the forceps two spiculæ were extracted, one, quite large, situated 1.5 cm. from the orifice, the other, smaller, 4 cm. deep. Drain.

From this time on the patient behaved exactly like one with a brain abscess in process of cure. It should be stated, however, that there was a slight meningeal reaction characterized by a Kernig, some vomiting, and for 15 days, a diplopia due to paralysis of the right external motor oculi. At the second and third dressings the discharge had an only consistence and appearance, with a few strings of pus in it. During the period there were two crises of general epilepsy, one of five minutes and one of ten minutes' duration, twelve days apart and followed by lighter and lighter attacks of Jacksonian epilepsy.

February 25, the wound was completely cicatrized. The patient had only a left hemiparesis and plantar hypoesthesia.

Last February, three years after the last examination, I had news from him. He still complained of a slight headache but of that only.

CASE XI.—DEEP PERFORATING BULLET WOUND OF THE LEFT TEMPOROMASTOID REGION. RECOVERY.

Lieutenant B. was wounded by a bullet June 27, 1916, at Fleury. He entered the Center July 4. At the first examination he was found to have a wound of the left auricle and mastoid region, with traumatic suppurative otitis media. He had aphasia, agraphia, amnesia, slowing of the pulse and prostration. No fever. Pupil reflexes normal. Slight papillary stasis. Radiographic examination revealed numerous deep spiculæ in the upper mastoid and lower temporal regions.

Operation, July 11. Classic mastoid incision, prolonged above to the temporal fossa, and a horizontal incision extend-

ing to this at the mastoid border. All the upper part of the mastoid region and adjacent temporal fossa showed considerable shattering. Especially notable were:

1. A spicule which had penetrated into the lateral sinus. On removing the spicule the sinus bled copiously.

2. Destruction of the entire lower third of the temporal fossa. Five or six spicules were in the cranial cavity; some compressed the meninges, others had perforated.

3. A brain abscess (sphenotemporal lobe) which had opened in the region of what had been the antral roof, the orifice giving issue to pus and brain matter. A No. 26 drain was introduced to a depth of 5 or 6 c. m.

Operative results: July 16.—Diplopia, slight photophobia, papillary stasis, and paralysis of the external motor oculi on the right—that is to say, the side opposite to the wound.

July 27. Same symptoms. There was also a right facial paralysis from which it was concluded that there existed a meningeal lesion limited to the apex of the petrous. Locally the drain, which was changed daily, gave issue to pus and sphacelated brain substance. About it the meninges were thickening. Nevertheless there was a tendency to cerebral hernia which was restrained by a pressure dressing.

July 30. The hernia had reached the size of a small nut. It could not exceed this volume because of the fibrous transformation of the meninges about the drain and the firm adhesions between the meninges and mastoid wound. Thenceforth evolution was normal, and on December 1 the officer showing only a slight brain hernia, covered with new formed epithelium, and some trouble with speech and memory, was sent to the neuropathologic center.

When seen again in February, 1919, more than two and a half years after the operation, he complained only of a little headache, some vertiginous phenomena, and total deafness on the left side.

FOREIGN BODIES IN THE BRAIN.

We find spontaneous exclusion of the subarachnoid spaces from cases of foreign body in the brain. It presents itself in two different forms: Either the meninges do not close because of rapid suppuration and a breach persists around which

adhesions form, or the meninges close behind the projectile and their cicatrization leads to the formation of a fibrous coating. In the first case we are dealing with a fistulous brain collection. The treatment, then, consists in utilizing the track, dilating it in conformity with the technic described, and when the dilatation is sufficient to permit extracting the projectile to take it out with forceps under the control of the fluoroscopic screen. Such an instance is described in Case 12, for which I am indebted to my colleague Durrien. In the second case the treatment consists briefly in "following the lesion"—that is to say, in going exactly through the fibrous thickening which has excluded the subarachnoid spaces. I have employed this technic in a patient whom I treated in counsel with my friend Dionis du Sejour. In this case to extract the projectile, which was lodged in the parietal lobe at a depth of 3 cm., the bistoury was made use of, but making only a small button-hole which did not go beyond the limits of the fibrous zone. Here again the operation, which was followed by cure, was done without invading the subarachnoid spaces.

CASE XII.

This is a brief report, for which I am obliged to Dr. Durrien. The patient was Soldier P., of the 414th Infantry. He was wounded at Craonne, May 10, 1917, by a bursting shell which caused a fracture of his skull near the left temporal region, with issue of brain matter. A piece of metal about one centimeter square was lodged in the left temporal lobe near the second convolution, at a depth of two centimeters.

When he entered the neurologic center, September 11, 1917, his symptoms were as follows: Headache, amnesia, slight brain torpor. No fever, pulse 60, exaggerated right rotation reflex, fundus of eye normal. Locally there was a small fistula corresponding to the wound of entrance, with free supuration. A probe passed into the track entered deeply. In sum there was an intracerebral projectile about which a collection had formed and was draining externally. It was decided to operate by the exclusion method of Dr. Lemaitre.

Preparatory operation, September 24. Curvilinear frontal incision outlining a skin flap. The uncovered bony orifice was not larger than a 50 centime piece. Trepanation, enlarge-

ment with the gouge. A drop of pus exuding showed the site of the meningocephalic opening. This orifice was very small, hardly admitting the probe which at a depth of 2.5 cm. came in contact with the foreign body. No attempt was made to extract the latter, since the operation was for the sole purpose of dilating the meningeal opening and reinforcing the adhesions which had already excluded the dura mater about the fistulous track. To this end a drain of 2 mm. diameter was introduced into the fistula, requiring considerable force.

September 28. No meningeal reaction. The dilated track admitted a drain of 4 mm.

September 29. The former drain, which allowed the escape of a drop of pus, was replaced by a drain of 5 mm.

September 30. A drain of 6 mm. was put in with some difficulty.

October 1. Same drain as on the day before.

October 2. Drain of 7 mm.

Second operation, October 3. Extraction of the shell piece with forceps under guidance of the fluoroscopic screen. It was an irregularly rounded piece of shell with sharp projections measuring 7 or 8 mm. in diameter. Grasping the bit with the forceps was somewhat difficult, for it was movable and displaced apparently more deeply into the temporal lobe. Extraction, on the other hand, was accomplished easily, without tearing the walls of the dilated fistula. A drain 7 mm. long was put in.

The immediate postoperative results were good. There was no meningeal reaction, no fever, less headache, gradual resumption of cerebral function. From the time of operation the case was treated as an ordinary cerebral abscess. There was normal progress to cure until December 15. On that date the patient was absent four days without leave, during which time his wound was not dressed. December 19 he returned to the hospital with the following symptoms: Violent headache, brain torpor, left hemiparesis, sensory aphasia, word-blindness, rather pronounced word-deafness, no paraphasia, no papillary stasis, slight rigidity of the neck.

December 20. Same condition; temperature, 40° C. It was decided to operate. The operation consisted in replacing the drain in the old abscess cavity, from which abundant pus

issued. In spite of drainage the symptoms increased during the subsequent days, and the patient died January 2, 1918.

At autopsy pus was found in the left lateral ventricle and in the third ventricle. There were scattered plaques of meningitis about the upper part of the Rolandic fissure.

WOUNDS OF THE BRAIN, WITH OR WITHOUT HERNIA.

Wounds of the brain which do not immediately produce death tended to repair themselves by the formation of scar tissue which rapidly induces fibrous adhesions of the meninges and brain.

Patients of this kind present themselves to us after the injury with a wound in the midst of which the brain mass is seen more or less modified and with its periphery constituted by a cicatricial zone equivalent to the fibrous ring of fistulized cerebral or cerebellar collections. Just as in the case of such collections an exclusion of the subarachnoid spaces has been effected, which explains why the surgeon should respect the edges of the wound, although he may perform any maneuver required by the local condition of the patient.

The first case of this sort that I shall report was one with a large wound of the occipital region, from which projected a sphacelated hernia of the brain as large as a small orange. I was able to remove all the herniated material up to the immediate vicinity of the occipital cornu of the third ventricle, which was even opened, as I was able to determine at the first dressing.

The patient was operated on in September, 1915, recovered, and wrote to me eighteen months later that on returning to his home he was adjudged capable of army service.

The second case, quite analogous to the first, was one with a wound of the frontal lobe and a hernia of the brain, smaller but also sphacelated. The third case was a brain wound without hernia, in which on enlarging the bony opening the peripheral meningeal adhesions could be clearly recognized.

The fourth and last case was a wounded man who died of encephalitis four or five months after the operation, although he left the hospital apparently cured. In this connection it is understood that wounds of the cerebrum or cerebellum call for a very reserved and late prognosis.

Exclusion of the subarachnoid spaces, either spontaneous or induced, gives a sort of insurance against meningitis and hernia, but cannot be a great safeguard against the complications of encephalitis.

CASE XIII.—VOLUMINOUS SPHACELATED HERNIA OF OCCIPITAL LOBE. RECOVERY.

Soldier V. was wounded in the head August 2, 1915, by a shell during an attack. He sustained shock with loss of consciousness for one or two hours. Without assistance he returned to the rear, was transported to a first aid station, then evacuated in an ambulance. The following day he was trephined for an occipital wound with extrusion of brain matter.

He arrived at the O. R. L. center at Clermont on August 2d. His symptoms on entry were as follows: Wound of the right paramedian occipital region; brain hernia the size of a small orange. General condition defective; considerable emaciation; intense headache; temperature normal; pulse slowed; vomiting. In the presence of these symptoms it was decided to operate quickly.

Operation consisted in:

1. Crucial incision enlarging the skin wound.
2. Enlargement of the trephined area from its original size.
3. Removal with a curette of all herniated necrotic brain matter, which appeared to be the posteroinferior portion of the occipital lobe.
4. Inspection of the circumference of the meningeal wound, which showed adhesions to the brain. The adhesions were carefully respected.

Operative results: The necrosis lessened, vomiting became less frequent, and the general condition improved.

Locally, the brain wound did not tend to necrose further, but, at the first dressing a probe five or six centimeters entered the ventricle. Healing was accomplished by granulation and epidermization.

He left the hospital December 14, showing no symptoms other than slight headache and persistent hemianopsia.

April 5 of the following year, he wrote to me, saying that these symptoms still persisted.

CASE XIV.—STRANGULATED, ABSCESSED HERNIA OF THE FRONTAL LOBE. RECOVERY.

Soldier R. was wounded in the right frontal region by a bomb, October 19, 1915, at Tahure. He was taken away in an ambulance on the 20th, and the same day had a trepanation and an enucleation of the right eye. He entered the O. R. L. center at Clermont-Ferrand, November 14, with the following diagnosis: "Trepanation of the right frontal region; wound not cicatrized." On entering he presented locally a wound of the right frontal region with persistent and rather abundant suppuration.

Operation, November 20. Curvilinear incision, tracing a flap. Elevation of the periosteum. The cerebral hernia appeared to be the size of a nut jutting out through the trephined opening. The dura mater appeared healthy, at the periphery, and formed about the hernia, which it strangulated, a very evident fibrous ring which measured eight or ten millimeters in breadth. The hernia leaked pus from several small orifices.

The herniated brain matter was resected with a knife, and with a curette two small spicules were extracted from the subjacent brain. The skin wound was curetted, was then the size of a five franc piece, and after suture of the flap left an opening through which the brain wound could be explored. A flat, slightly compressive dressing was applied. Healing took place by granulation. February 21, 1916, the patient left the hospital and was sent to the ophthalmologic center for ocular prosthesis.

CASE XV.—WOUND OF THE RIGHT FRONTAL SINUS REGION WITH EXTENSIVE DESTRUCTION OF MENINGES. RECOVERY.

Private D. was wounded April 29, 1915, in the right frontal region by an exploding shell. He was taken to the evacuation post in an ambulance, where he was trephined. July 22 he came to the Center because of "fistulæ and suppuration near the right superciliary ridge." Cerebral pulsation persisted at the point of trepanation.

Operation: Incision in the eyebrow as for a frontal sinus operation; vertical incision above it corresponding to the

cerebral pulsation; elevation of periosteum. The pus filled frontal sinus no longer had any posterior wall. Above it the brain, which was adherent to the skin, was denuded of its meningeal covering over a surface the size of a five franc piece. Around this area the meninges adhered to the brain like a fibrous coat. The frontonasal canal was curetted and the frontal bone was smoothed with forceps. The skin was united by sutures save over the denuded cerebral convolutions, to which a slightly compressive flat dressing was applied.

Operative results were normal. February 16, 1918, he was sent to the hospital depot with a recommendation for service in the reserve.

CASE XVI.—ABSCESSED HERNIA OF THE FRONTAL LOBE. DEATH.

Private C. was wounded at Beausejours June 21, 1915. He was evacuated by ambulance and trephined the same day. From there he was sent to Hospital No. 7 of the 15th Region, and sent to me October 14. On his entry there was noted slightly above and external to the sinus a brain hernia the size of a pigeon's egg covered with granulations and pulsating. The patient complained of headache and vertigo. His pulse was a trifle slow. There were no disordered reflexes and no fever.

Operation, October 19: Curvilinear incision forming a flap, elevation of periosteum, enlargement of the trepanation until normal dura was uncovered. The border of the cerebro-meningeal wound was carefully respected, while, on the other hand, the central portion was curetted. Pus to the amount of a spoonful and a half was discharged. With the curette two small spicules were brought up from the deeper tissues. A fenestrum of about four centimeters in diameter was made in the flap and the latter was sutured. A slightly compressive dressing was applied.

Operative results were normal. Healing was by granulation and epidermization. While awaiting presentation to the service commission the patient was sent on convalescence service. In January he was sent urgently to a hospital where he died of encephalitis.

Autopsy showed the signs of a diffuse encephalitis. It also established that besides cerebro-meningeal adhesions there was

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Autopsy showed the signs of a diffuse encephalitis. It also established that besides cerebro-meningeal adhesions there was

a fibrous transformation of the meninges for a considerable distance about the traumatized area.

CONCLUSIONS.

1. The meninges, like all serosa, protect themselves by forming adhesions.

War wounds furnish us daily examples.

These adhesions produce an actual spontaneous walling-off of the subarachnoid spaces, comparable in every way to the exclusion of the greater peritoneal cavity.

The surgeon should respect these adhesions and sometimes add to their usefulness by reinforcing them.

2. The meninges when they are healthy may, at any desired point, be transformed into a fibrous layer.

This fibrous covering, whose formation is obtained at will, constitutes an induced exclusion of the subarachnoid spaces.

The surgeon should always do this when he intends to go into the brain.

3. Induced exclusion of the subarachnoid spaces can be accomplished almost infallibly by a simple precise technic.

4. The advantages of an induced exclusion are these:

Meningitis is averted; brain hernia is avoided.

5. Meningeal exclusion finds application in the treatment of cerebral and cerebellar collections of whatever origin. It can also be applied in other varieties of brain surgery, such as the search for and extraction of certain foreign bodies.

6. Exclusion of the subarachnoid spaces, by its altering the prognosis in surgical affections of the cerebrum and cerebellum, seems to mark important progress in brain surgery.

II.

LEUCOPLAKIA LARYNGIS.

BY NORVAL H. PIERCE, M. D.,

CHICAGO.

Keratosis as it affects the larynx is most frequently limited to the region where pavement epithelium forms the normal covering, namely, the interarytenoid space and over the vocal processes; it is then most commonly known as a pachyderma laryngis.

However, the disease does rarely appear in regions where cylindrical epithelium is the normal covering, namely, on the upper surface of the vocal cords. These occurrences have been used in support of metaplasia hypotheses by adherents of that thesis. As islands of pavement epithelium are found in laryngeal tissue where cylindrical epithelium is the normal covering, it is more reasonable to suppose that the keratosis develops from these islands than that one type of epithelium is transformed into another. The case reported by Flatau would seem to point to the probability of one type of epithelium being able to replace all other types found in the larynx.

The disease as it occurs in these extraordinary regions is rare, and for this reason I have availed myself of the privilege of reporting the two following cases:

G. DeV., male, age 63, a composer of music and vocal teacher, a student of Garcia, came from England to visit the Chicago World's Fair. He determined to remain in Chicago and opened a studio. He consulted me because of a hoarseness which appeared whenever he used his voice to an unusual extent in vocalization. He was a vigorous, well preserved man, and at the time I first saw him was not at all hoarse. Laryngoscopy disclosed the following picture: A large larynx; the interarytenoid space and vocal processes were normal. In the middle of the left vocal cord was a pearly white patch about a fifth of an inch long. Laterally it extended from the outer border of the vocal cord to its inner edge, over which it projected in a finely serrated manner.

The anterior and posterior edges of the patch were square, but had a frayed appearance—that is, delicate pearly white lines alternated with pinkish interspaces. There was no interference with movement of the cord. The rest of the cord was slightly more hyperemic than the right, which was of the brunette type. Considering the man's age and the laryngeal picture, malignancy was suggested to my mind. However, he was advised to use his voice as little as possible, and requested to report from time to time for observation. This he did for a period extending over five years, and no striking change occurred in the appearance of the disease other than this: he informed me that occasionally he coughed up a small piece of membrane. He was never able to save this for me so that I could never examine it myself, but after such an occurrence the patch was distinctly less white in appearance. In all probability we had here a periodic desquamation of the outer layers of epithelium from the plaque of leucoplakia. He returned, I believe, to England after an unsuccessful struggle in America, and I have not heard from him since.

A. B., male, age 57; American; a grain operator; dealt extensively "on the floor"; used tobacco and spirits liberally. Consulted me in consequence of hoarseness. The laryngoscope revealed a pearly gray patch about a quarter of an inch long on the middle of both vocal cords, the edges of which were irregular. The cords themselves were pink and distinctly thickened. The mucosa over the vocal processes was thickened and of a deep red color, but there was no visible pitting. The movements of the cords were normal. He was advised to abandon floor trading, and the usual treatment for chronic laryngitis was instituted. The inflammatory condition subsided, and his voice, though cloudy, lost much of its hoarseness. The patches remained unchanged. During the course of three years he had many relapses, which were easily explained by vocal abuse on the Board. At length, after an unusually severe relapse he returned to me with the information that he at last had come to agree with me regarding the cause of his trouble, and had decided to go to California and give his voice a long rest. The appearance of his larynx at this time was distinctly alarming. The cords were more thickened, the edges more grossly irregular, but the patches were un-

changed or only slightly increased in area. He complained of a sense of discomfort in his throat. After some months' stay in California he again returned to Chicago. He could speak only in a hoarse whisper. There was dyspnea on exertion. The laryngoscope disclosed two tumor masses replacing the vocal cords with coarsely granular surfaces, pinkish white in color, and so large as to leave only a small chink between them in the middle line. The process had been diagnosed malignant from pieces excised. He had been advised to have the growth removed by the direct method. I disagreed with this opinion, my reasoning being thus: If the growth was malignant, nothing short of a laryngectomy extirpation could save him. If it was not, laryngofissure provided a more exact method of removal than direct laryngoscopy. The subsequent history of the case justified my view. The patient was tracheotomized, the larynx was opened, the growth removed, and immediate frozen sections confirmed its nonmalignancy. Radium was placed in direct contact with the cut surfaces within the larynx on several days, after which the larynx was closed. The man has had no recurrence after a year.

We have here several points of interest to contemplate.

1. Keratosis as it affects the laryngeal mucosa may infrequently appear primarily in regions other than those for which it shows a predilection and where the squamous type of epithelial cell is not the natural covering. Indeed, the entire mucosa of the larynx as well as that of the epiglottis may undergo this keratotic change, as exemplified by the case reported by Flatau. It may be well to remember that this keratosis is a disease per se, but may accompany other diseases, such as tuberculosis, syphilis and carcinoma itself. While in the first case there was no histologic confirmation, the diagnosis of leucoplakia was sufficiently confirmed by the laryngoscopic appearance and the clinical course of the affection. Herbert Tilley reports a case (Proc. Royal Soc. Med., 1915-1916) which in a general way corresponds to mine.

2. The desquamation feature in the cases that occur outside of the interarytenoid regions is interesting. Our distinguished guest and others have reported such instances. No doubt it frequently occurs in leucoplakia of the tongue and

vocal surfaces. Here, however, the scales are rubbed off by food and are swallowed without attracting the individual's attention. In the larynx, however, they form a source of irritation during the process of exfoliation and are forcibly projected into the mouth. One can readily imagine that if the case is first seen at the moment when the desquamation is occurring, this factor might add to the difficulties of a differential diagnosis. This is especially true when the process affects the lower margins of the cords.

3. The change in type which occurred in the second case from pachydermia planus to pachydermia verrucosa was interesting. The change is very simple and consists in the ingrowth of the epithelial elements and an increase of the connective tissue elements, and may be accounted for by the activating influence of whatever irritating agency causes the original disease, without a break occurring in the limiting membrane.

4. The method of approach in dealing surgically with such conditions as the second case illustrates may furnish a just ground for difference in opinion. It is my opinion that in certain cases where extensive disease of the interior of the larynx necessitates removal, laryngofissure is preferable to indirect or direct endolaryngeal methods, because it gives us greater liberty of movement, greater visibility, is more rapid and is quite as safe.

III.

HEMOPHILIAC TYPE HEMORRHAGE—TREATMENT BY TRANSFUSION.

BY AUSTIN A. HAYDEN, M. D.,
CHICAGO.

This paper is presented to emphasize the usefulness of transfusion in the control of hemorrhage in patients whose clotting time is abnormally slow, and in whom the bleeding persists as a capillary oozing after all mechanical means for hemostasis have failed. Its scope is limited entirely to the treatment of hemophiliacs, or perhaps more properly to patients whose blood clotting period is abnormally long.

In reality, hemophilia is a very rare condition, with an extremely interesting and extensive literature. The first description of the disease can be found in the Crerar Library in the original article by John G. Otto, early in 1803.¹ The "Natural History of the Village of Kinderbrook" immediately follows, showing the versatility of this publication. Otto, according to his bibliography, read by Isaac Parrish, M. D., the physician in his last illness, before the College of Physicians of Philadelphia by appointment March 4, 1845, was one of the earliest physicians of Philadelphia "to confine himself wholly to the practice of medicine, avoiding surgery and obstetrics." His observations on "An Hemorrhagic Disposition Existing in Certain Families" are stated in precise, well chosen English. With but few additions it would be a classic description even today.

"About seventy or eighty years ago, a woman by the name of Smith settled in the vicinity of Plymouth, New England, and transmitted the following idiosyncrasy to her descendants. If the least scratch is made on the skin of some of

1. "Medical Repository and Review of American Publications of Medicine and Surgery and the Auxillary Branches of Science—conducted by Samuel Latham Mitchell, M. D., and Edward Miller, M. D. Copyright secured, New York. Printed and sold by T. and J. Swords, Printer to the Faculty of Physic of Columbia College, No. 160 Pearl Street."

them, as mortal a hemorrhage will eventually ensue as if the largest wound is inflicted." He speaks of the blood being in a "high state of effervescence," of the various remedies that have been tried in vain, among them being "the bark, astringents used topically and internally, strong styptics and opiates. A few years since the sulphate of soda was accidentally found to be completely curative of the hemorrhages I have described. An ordinary purging dose, administered two or three days in succession, generally stops them: and by a more frequent repetition is certain of producing this effect. The cases in which the most powerful, and apparently the most appropriate remedies have been used in vain, and those in which this mode of treatment has been attended with success, are so numerous that no doubt can exist of the efficacy of this prescription. Deceptions may take place from accidental coincidence: but when a complaint has often occurred, and been almost uniformly fatal, without the administration of a certain remedy, and has constantly yielded when it has been given, skepticism should be silent with regard to its utility. Nor should our inability to account for the fact upon the theory and principles we have adopted be conceived as a sufficient reason for disbelieving it."

The proceeds: "The prescription being in the Smith family and the cases that have been attended by physicians not being very numerous, it is impossible to ascertain the various states of the system in which it has been given, or to form any correct conclusions regarding its manner of acting. No experiments have been made on the blood to discover if any, or what changes take place in it."

"It is a surprising circumstance that males only are subject to this strange affection, and that all of them are not liable to it"—although females are exempt, they are still capable of transmitting it to their male children, as is evidenced by its introduction, and other instances, an account of which I have received from the Hon. Judge Livemore, who was polite enough to communicate to me many particulars upon this subject. This fact is confirmed by Drs. Rogers and Parker, gentlemen of character, residing in the neighborhood. When cases shall become more numerous, it may perhaps be found that the female sex is not entirely exempt."

Benjamin Rush, Dr. Otto states, had seen two cases in his own practice and recites the history of a Maryland family of six children, four of whom died of bleeding from trifling scratches or bruises. A small pebble fell on the nail of the forefinger of the last of them when at play, being a year or two old; in a short time the blood issue from the end of that finger until he bled to death.

While Otto's paper was the origin of our knowledge of this subject, hemophilia was evidently known to the ancients. Abacusic or Asaharavius, the greatest surgical writer of the Moorish period, stated that in a certain village there were men, who when wounded only slightly, bled to death. Alexander Benedictus, 1539, tells of a Venetian barber who bled to death from a trivial wound on the nose inflicted by his own scissors.

Most of the literature has come from America. The most notable exceptions are the extensive monographs of Ludwig Grandidier,⁴ Wickham Legg⁵ and Bulloch and Fields.

The latter two define hemophilia as a "disease characterized by excessive or chronic liability to immoderate hemorrhage. The liability is hereditary and, in our opinion, based upon the published evidence, is confined to the male (bleeder) but transmitted by the female (the conductor)." This is generally known now as Nasse's law.⁶ The characteristic hemorrhage is a trickling, oozing from a surface and not from any one large vessel proceeding from a traumatism that would be of any consequence to a normal individual. It is always traumatic.

The most frequent sites are the nose, mouth (after extraction of teeth), joints, umbilicus in the newborn and penis following circumcision.

Cause and Occurrence.—The essential cause of hemophilia seems to lie with the blood platelets. The walls of these cells apparently are not sufficiently soluble to liberate their intracellular protoplasm (thrombokinase?) which is necessary for blood coagulation.⁷ Either the thyroid or liver or both may be responsible, for these alone, of all the body tissues of the hemophiliac, fail to promote blood coagulation.⁸

Frequently troublesome hemorrhages are accredited to the hemophiliac diathesis, and many patients are designated as

bleeders, in whom the clotting is well within the normal limits. In these cases adequate surgical means of hemostasis have not been used. They might well be designated as surgical hemophilia.

True hemophilia in reality is a very rare condition. Grandidier⁸ states that there were only ninety-three families of bleeders in the entire German empire in 1877, with but two two hundred and fifty-eight members affected. With the more accurate present laboratory methods this number would undoubtedly be decreased very materially were these cases examined at this time, especially since twenty-two of his cases were females.

Tendency to hemorrhage is seen in many of the following diseases. Of these jaundice is the most common; others of less frequent occurrence are typhoid fever, anemias, leukemias, purpuras, Barlow's disease, peliosis rheumatica and essential hematuria.⁹ Severe bleeding may follow diphtheria, quinzy, yellow fever, influenza, and surgical procedures, especially in the throat and nose (secondary hemorrhage). These cases must not be confused with true hemophilia.

Case Report.—Fréd A. B——, a married man, thirty-nine years of age, came to the writer in July, 1918, complaining of recurrent head colds and slight attacks of sore throat followed by rheumatic pains. His tonsils were enlarged. From their crypts pus could be freely expressed. His nasal septum was sharply deflected to the left low down. Family and personal histories were given as generally negative with the exception of a severe attack of smallpox he had suffered years ago. Syphilis was denied. His general physical examination was negative. His nose and throat work was done under general anesthesia a few days later. The submucous resection (after Killian) was confined almost entirely to the cartilages. One Bernays sponge was inserted into each nostril. The flaps were not perforated. The tonsils were removed by dissection and snare. The bleeding was less than usual from each. Both tonsil fossæ were dry when the patient left the operating room. The operation was commenced at 8 a. m. and finished at 8:30 a. m.

Five hours later (1:30 p. m.) the nurse reported that the patient's bleeding, which had commenced about half an hour

after his return to bed, was not stopped. At 2:30 p. m. another Bernays sponge was placed on each side of the nose. At 5:30 the bleeding from the nose was continuing at about the same rate—i. e., twenty-five drops a minute, with some trickling back into the throat. The sponges were removed, the flaps separated and the septal cavity was carefully suctioned and sponged in an effort to locate the bleeding point. This was unsuccessful. In about half a minute the cavity would slowly fill up with blood which appeared to well up from all over. The Bernays sponges were reintroduced with strips of tannic acid gauze packed tightly against their outer sides.

At 8:30 p. m. the bleeding was still continuing at the same rate from the nose and mouth. The posterior nares was now seemingly packed on the left (operated) side and the sponges and tannic acid gauze were replaced. Coagulation period by the glass pipette method was taken and found to be fifty minutes. Hemoglobin was eighty per cent. The patient was feeling well, remarkably well in spite of his very considerable loss of blood.

At 9:30 p. m., twenty cc. of normal horse serum was given deep in the muscles of the abdominal wall. At 11 p. m. (fifteen hours after the operation) the blood was still dripping from the nose, about twenty-five drops a minute, with a considerable amount running back into the throat. Dr. Henry W. Ablemann transfused one hundred cc. of blood from the arm of the patient's sister, who was mistaken for his sister-in-law. The bleeding seemed to be less, and the patient was returned to his bed after having received one-quarter grain morphin.

At 8 a. m. (twenty-four hours after the operation) blood was trickling from his nose and running back into his throat at the same rate. A second transfusion was made—this time from his sister-in-law instead of his sister. Five minutes later the bleeding had stopped completely. The coagulation period was now five minutes. The hemoglobin was seventy per cent. The patient was feeling splendidly and asking for something to eat.

On questioning the patient's father closely some vague history of severe bleeding was elicited in an uncle on his

maternal side. The patient's sister, in the first and unsuccessful donor, is a young unmarried woman. It will be extremely interesting to note whether or not she proves to be a conductor of hemophilia. Her coagulation period was six minutes. She had had an uneventful abdominal section within the year. The second donor's (sister-in-law) blood clotted in eight minutes.

The author is fully aware of the fact that the above case does not entirely meet the requirement laid down by Bullock and Fildes.⁹ These excellent investigators maintain that no single hemorrhage, however severe or inexplicable, can properly constitute a diagnosis of true hemophilia—only repeated bleedings either from birth or early childhood are sufficient for this.

In conclusion, however, some interesting speculations arise:

1. Can the coagulation period of non-hemophiliac blood be so long as to cause a hemorrhage such as this patient had? Is the hemophiliac himself always a hemophiliac or will his blood at times clot normally or nearly so?

2. Are the tissue juices that favor coagulation more abundant in the throat than in the nose? This would explain the dry tonsil fossae.

3. How lasting may the results of transfusion be? Two months later this patient had an uneventful tooth extraction.

4. Enormous quantities of blood can be lost, if the bleeding is slow. In this case probably more than four quarts of blood was lost in twenty-four hours by nose and mouth. At the end the hemoglobin was 70 per cent. and the red cells three and one-half million.

5. Transfusion in such cases, seems to be the logical and sure way of stopping the bleeding. Abelman's splendid technique¹¹ reduces what was formerly a formidable major operation to a very simple, bedside if necessary, procedure.

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IV.

THE OTOLARYNGOLOGIC FEATURES OF THE
INFLUENZA EPIDEMIC AT CAMP HANCOCK,
GEORGIA, SEPTEMBER-DECEMBER, 1918.*

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At an officers' meeting held immediately after dinner on Sunday, Sept. 29, 1918, it was announced by the Commanding Officer of the Hospital that telegrams had been received stating that in the course of the day two troop trains would arrive at Camp Hancock. On one of these trains were 50 sick soldiers and on the other 90. It was further announced that beds had been made available for these men and that the hospital was in every way prepared to receive them.

Early in the evening the sick boys began to arrive and it was seen almost at once that the number would be far in excess of that indicated by the telegrams. From late afternoon till well into daylight next morning they came pouring in, brought from the railway station by ambulance and truck. When a count was made it was found that instead of 140 sick soldiers, the morbidity in the trains had increased with such speed and to such an extent that 770 men were brought to the Hospital directly from those trains.

While a few sporadic cases had developed in Camp Hancock, the real epidemic began, and in very stormy fashion, with

*Read before the American Laryngological Association, June, 1919, and published by authority of the Surgeon General.

this influx from the troop trains from Camp Grant. And a very sick lot of boys they were!

Almost at once were the specialized services of the members of the Otolaryngological Department called for, the first complication requiring attention consisting of many cases of violent and persistent epistaxis. As the days passed other phases of the disease developed and had to be taken care of.

The main concern of the department was the ear, especially in its suppurative and mastoid aspects. The Chief of Service at Camp Hancock was determined from the first to leave unattended to no detail which would promote the healing of acutely affected ears and prevent mastoid complications. In this he was ably and untirely supported by the members of his Staff, by the Chief of the Medical Service and by the Ward Surgeons, by the former in ordering and carrying out the treatment decided upon, and by the others in co-operating in every way in carrying out the plans laid down.

In order that all such complications should receive prompt attention a request early was voiced at an officers' meeting that all cases of ear pain be reported at once to the Department of Otolaryngology. This was to be in force both during the day and night. This request soon was found to be insufficiently broad, because in the first days of the epidemic it was noted that some middle ear cavities were found to be filled with pus, with the patient complaining, not of pain, but only of deafness and a sense of fullness in the ear. As a result of this observation it was requested that any patient complaining of any ear symptom whatsoever, even if only a sense of fullness, be immediately reported to the Otolaryngological Department. In order that no calls should go unanswered an orderly constantly was on duty in the Head Section Building, one orderly sleeping in the building near the telephone. It was hoped in this manner to secure prompt 24-hour service, and such in fact proved to be the outcome.

By this plan, nearly if not quite every patient who presented ear symptoms was seen by a specialist within half an hour of the time notification of his condition was received by the department.

In carrying out the details of visiting the cases, the hospital was divided into three equal parts, and to each part was

assigned one junior member of the staff. These men started in at 8 o'clock in the morning and made rounds of the portions of the hospital assigned to them. At each ward or tent group the surgeon would see the cases which he knew required attention and would inquire as to whether or not there were any others. At 10:30 a. m. each man would telephone the clinic to find out if any emergency calls had been sent in from the portion of the hospital under his care. The night calls were answered by the officer on emergency duty, and when there was more work than he could handle, a second, and sometimes a third member of the department was called upon.

The chief of the department remained throughout the day in the Head Section Building, receiving calls and distributing them, and seeing with the ward visiting surgeons those cases on which the latter desired the opinion of the chief.

The main difficulty met with in examining and treating the patients was in securing adequate illumination. When it is realized that at least two-thirds of the sick boys were on porches or in tents the force of this statement will be more fully realized. Whenever possible, sunlight and diffuse daylight were used. Frequently the patient would be in such a position in ward, porch or tent that the rays of the sun could be focussed by the head mirror on the region being examined. This made an ideal light and was taken full advantage of. Diffuse daylight could be used in examining throats, but of course was of no value in examining the nasal cavities and ears.

The usual source of illumination was oil lanterns, with which each ward and tent group was provided. This was very satisfactory in the wards, but on porches and in tents the presence of so much diffuse sunlight rendered impossible clear illumination of the nasal chambers and of the external auditory canal and ear drum. This difficulty was overcome by having orderlies hold a blanket around the surgeon and patient, thus making a screen and forming a dark room, and cutting off sufficient daylight to allow the reflected light from the lantern wick to illuminate with all necessary clearness the parts being examined.

A second handicap was the impossibility, on account of relative shortage of nurses and orderlies, of carrying out in

detail the routine ear treatment which was in force in the hospital.

Otolaryngologists agree that in all cases of acute tubotympanic disease treatment of the nose and nasopharynx is advisable, not to say imperative. Under the conditions in which this epidemic was handled, it was utterly impossible to administer such treatment. The nursing and orderly staffs were driven to the utmost in order to carry out the fundamental necessities of general treatment, and neither personnel nor appliances were available for nasal treatment. Almost to a man the cases of ear involvement went through the attack with no treatment except to the ear, and so successful was the outcome that one is tempted to question the vital necessity for nasal and nasopharyngeal treatment as a routine measure in acute middle ear disease.

As stated above, the main concern of the department was to minimize to the utmost the effects of involvement of the ear. For each case of acute otitis media, whether open or closed, it was endeavored to have administered the simple treatment described below. On account of the wide scattering throughout the entire hospital of these cases, the amount of time required to administer the treatment, the shortage of skilled nursing and the lack of paraphernalia, it was not possible in all cases to have it carried out. When it is realized that the number of patients in the hospital jumped in a few days from 1,500 to nearly 4,000, the obviousness of these difficulties will be appreciated. In addition, three members of the otolaryngologic staff were victims of the influenza, none fatally, however, but nevertheless throwing a very heavy burden on the rest.

This routine treatment was as follows:

1. Absolute rest in bed.
2. Irrigation of the ear every four hours with 2,000 c. c. of hot normal salt solution. The more severe cases received irrigations every three, and even every two hours.
3. Filling of the ear with a hot solution of phenol (10 per cent) and glycerin (90 per cent).
4. Filling the ear loosely with absorbent cotton.
5. Covering the ear with a large wad of absorbent cotton, which was bandaged in place.

6. Keeping a hot water bottle constantly against the bandaged ear.

As the ear improved, first the heat, then the bandaging and finally the irrigations were dispensed with.

As a result of the system of prompt notification of the department of all cases presenting ear symptoms, practically every case was seen in its earliest stages. If the ear drum was found to be normal in contour, the treatment just described was ordered. If the slightest amount of bulging was present the rule followed was to incise freely and at once. Each ward visiting surgeon carried with him the appliances for performing this little operation. There is no doubt that there may have been opened some middle ears which would have gone on to resolution without complications or sequelæ, but it is certain that there were no ear drums needing an incision that did not have one.

When an anesthetic was used, it was the usual mixture of equal parts of cocain, phenol and menthol. Sometimes it was effective and sometimes it was not. When the patient was very nervous and time would allow of it, an attempt was made to benumb the ear drum with this solution. Otherwise the drum was opened without an anesthetic.

The results of our plan of procedure can best be shown by reference to the figures for October, November and December. The real epidemic began, as stated above, with an influx of patients on Sunday, September 29, 770 cases being admitted to the hospital on that day and during the night following.

During October many hundreds of ear cases were seen in bed and in clinic. On account of the hectic conditions under which everyone was working, it is impossible to give the exact number. During November the number was smaller and during December it was smaller still.

In the three months there were 322 cases requiring myringotomy. In a few instances a second incision had to be made, and on still fewer a third. Of these cases 202 required incision of the ear drum in October, 89 in November and 31 in December. Many of these developed tender mastoids. When the latter condition appeared a special endeavor was made to have the patient transferred to a ward where the routine treatment

described above could be administered. The result was a most happy one, as not a single one of the October cases required a mastoid operation, report for that month reading:

Myringotomies.....202 Mastoidectomies..... 0

There were no cases of sinus thrombosis and none of otitic meningitis; in addition none of the acute suppurative middle ear cases became chronic, everyone sending in a dry ear and a healed perforation.

By the following month (November) the epidemic was on the wane, and the work of the department had lightened materially. The November report read as follows:

Myringotomies 89 Mastoidectomies 4

Only two of these operations followed influenza, and both of them occurred in one soldier. This boy was a very septic specimen, with a negative Wassermann reaction. First (October 24, 1918) he developed a large external perichondritic abscess of the thyroid cartilage, which was opened and drained. This was followed later (November 13, 1918) by a mastoid abscess of the left side, and still later (November 16, 1918) by the same condition on the right. Both of the other November mastoids were cases in which the middle ear became involved in the course of an acute coryza.

In December there were five mastoid operations performed and two of these were postinfluenzal. Of the others, two followed measles and one a coryza. The December report read as follows:

Myringotomies 31 Mastoidectomies 5

In this month the influenza incidence was very low, until about the middle of the month, when there was a slight recrudescence of the disease. The great majority of the ear cases in December developed in connection with either a coryza, measles or scarlet fever.

These figures, in the minds of the writers of this report, constitute rather a notable showing. The total admissions of influenza cases to the Base Hospital for the month of September-October (including September 29th and 30th) were 6,553. In November there were 1,162 and in December 66, making a total of 7,781. In addition to this, during those three months there were 426 admissions for measles and 418

for scarlet fever. Added to these there were a large number of cases admitted on account of ear or throat or nose conditions alone. From this large number resulted only eight cases requiring mastoid operation, one of these being bilateral, thus making nine operations in all. It might be added that all of them healed or are healing in the usual four to six weeks, with no complications or threatened sequelæ. One of them developed decided weakness of the facial muscles of the affected side, but shortly after the mastoid was cleared out the symmetry of the face returned to normal.

HOSPITAL ADMISSIONS.

	Influenza	Measles	Scarlet	Myring- otomies	Mastoid Operations
*Sept.-Oct.	6553	145	6	202	0
November..	1162	215	401	89	4
December..	66	65	11	31	5
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
Total	7781	426	418	322	9

MASTOID OPERATIONS.

	Post- influenza	Post- measles	Post- scarlet	Post- coryza	Total
*Sept.-Oct.	0	0	0	0	0
November..	2	0	0	0	0
December..	2	2	0	1	5
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
Total	4	2	0	3	9

*From September 29th to October 31st, inclusive.

It is barely possible that during the fall and early winter of 1918 the organisms which attacked the upper air passages had a very slight selective affinity for the mastoid. The notable escape of the tympanic adnexa from serious trouble at first tended to support this view. But as the season advanced and the acute exanthemata began to come in in increasing numbers, and still the mastoid incidence remained negligibly low, it seemed justifiable to assume that the prompt and careful treatment accorded all ear cases was an important factor.

It is quite probable that this low percentage of mastoidectomies could hardly prevail in civil practice, because such immediate and painstaking treatment would not and could not be obtained. One factor in this would be that ear affections frequently are considered to be trivial matters by a certain element both of the medical and lay population. Furthermore it should be realized that the soldier patient is under orders, and is obliged to submit at once to whatever treatment is deemed best for him, with no opportunity afforded him of refusing or postponing the measures decided upon by his officer surgeon.

In the external ear there developed a few (seventeen) cases of furunculosis and a large number of serous or serosanguinous blebs, the latter being the condition called by Politzer *otitis externa hemorrhagica*.

Otitis externa hemorrhagica. This condition was found almost exclusively in the influenza cases and always was confined to the osseous portion of the external meatus. Sometimes the blebs would be of a purplish hue and at others clear and watery, resembling on the one hand a "blood blister," or, on the other hand, an ordinary "water blister." At first they were routinely incised, but later they were left alone unless they interfered with inspection of or drainage from the middle ear. Quite frequently they were found to be as sensitive as is the ear drum.

Epistaxis. But one obtruding condition was found in the nose, and that was profuse and persistent epistaxis. In every case but one the bleeding point was located at the anterior part of the septum, the so-called locus Kieselbachii. In the one exception a spurting artery was observed on the lateral wall of the nose at the anterior end of the inferior turbinated body. The incidence of epistaxis was the greatest in the first influx of cases. These boys were brought in directly from the troop trains after two days or more of travel with limited bathing facilities, and it is believed that the irritation and excoriation of the nasal mucosa produced by the train dirt was an important causative factor. Epistaxis became much less frequent in the later days of the epidemic, when the cases were developing in those soldiers which had been in camp for several days.

Sinusitis. The incidence of sinusitis was exceedingly low. Exact figures are not at hand nor are they obtainable. When a case of this sort developed, a routine spray of adrenalin chlorid, 1 to 7,000, was given every hour, and when the pain was severe the middle meatus was packed for half an hour or more with cotton pledgets saturated in the same solution. All of these cases returned to normal and none required operation for their relief.

Tonsils. There were very few cases of tonsillitis and still fewer of peritonsillar abscess. During the months of October, November and December there were but thirteen cases requiring the evacuation of pus.

Larynx. Laryngitis was present in quite a few cases, and the manifestations in the larynx were of three different types: (1) Diffuse catarrhal laryngitis, with the usual appearance found in this condition; (2) ulcerative laryngitis, with small, narrow, superficial ulcers running lengthwise of one or both cords, and (3) what might be called "asthenic laryngitis."

A section of ulcerated cord from a case of type 2 was submitted to the pathologist, who reported on the specimen as follows: "Section shows mucosa with an irregular loss of substance, with submucosa exposed, which with muscle tissues still deeper is infiltrated with polynuclear leucocytes. Diagnosis: Acute inflammation of vocal cords with ulceration."

The last form, 3, deserves a more detailed description. It was found almost entirely in a group of cases which came from among the soldiers who had been in Camp Hancock for some time. It was characterized by a normal or slightly reddened mucosa, absence of ulcerative lesions and mainly by a marked weakness of the laryngeal musculature. An attempt at phonation would result in a feeble effort to approximate the vocal cords and an immediate discouraged return of the cords to the respiratory position. A similar condition of the palatal and pharyngeal and probably of the esophageal musculature usually was found to be associated with it. The muscular efficiency of the entire throat was very low, and it was tested out in one patient by having him endeavor to swallow a large mouthful of water. The effort at deglutition immediately was followed by a gush of water from his nose and by cyanosis. It was evident that the muscles neither of his soft

palate nor of his larynx had the strength to close off the entrances to the cavities which they guard. In a short while he was able by a few weak coughs to clear his larynx and trachea, but for the moment it looked as if he was in imminent danger of suffocation from the water, which he was unable to prevent entering his trachea and then was almost unable to expel from it.

The actual cause of this condition could not be determined. Possibly it was a toxic myositis, possibly just a part of the general asthenia, possibly it was due to a toxemic poisoning of the centers in the medulla, really constituting an acute form of bulbar paralysis.

The members of the otolaryngologic staff feel that they were in great good fortune to have been at Camp Hancock during the epidemic. Rarely does a physician or even a collaborating group of physicians have an opportunity of studying synchronously such a large series of cases, occurring in people of approximately uniform age and living under identical clothing, housing and dietary conditions. Usually observations on a large number of cases must extend over a long term of years and under such conditions early impressions and conclusions are likely to grow hazy and later ones assume undue prominence and force. While necessarily conditions in this epidemic were such that an accurate record of all phases of the influenza was impossible, still it is felt that so careful an estimate has been made where actual records were not obtainable that conclusions drawn can fairly be considered as being based actually on numerical fact.

V.

EXTRADURAL IRRITATION AND ABSCESS.*

By R. H. GOOD, M. D.,

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In presenting this paper the author hopes to contribute something to the subject which will help to early recognize the symptoms of extradural irritation or abscess, so that by early exposure of the dura many serious and fatal complications may be prevented.

The dura is composed of two layers, the outer, or periosteum, and the inner, or vascular. It lines the cavity of the skull like a periosteum and surrounds all the nerves and blood vessels at the openings into the skull and joins with the periosteum on the outside of the skull. The inner layer only of the dura surrounds the optic nerve all the way to the eyeball. This explains why toxins in the orbit so easily gain access to the optic nerve, causing optic neuritis or meningitis. The dura not only lines the skull, but extends deep between the hemispheres of the brain, forming the falx cerebri and falx cerebelli as well as separating the cerebellum from the cerebrum by the tentorium cerebelli.

The dura is extremely vascular, enveloping nearly all the large arteries and veins in the skull. The anterior fossa is supplied by the anterior meningeal branches of the ethmoid arteries and internal carotid; the middle fossa by the middle meningeals, branches of the internal maxillary, the recurrent from the lacrimal and the ascending pharyngeal branches from the internal carotid; the posterior fossa by the posterior meningeal branches from the vertebral and the meningeal branches of the occipital arteries.

All this blood is carried away from the head by the venous sinuses which are all in the dura. I have emphasized the above to show that any slight hindrance of the return circulation in the dura may cause capillary edema and produce marked

*Read before the Chicago Laryngological and Otological Society May 5, 1919.

symptoms. The skull cavity is completely filled with tissues and any slight increase or decrease in its contents will produce symptoms.

The dura is also well supplied with nerves and therefore a very sensitive organ and very painful on manipulation, whereas, the brain tissue itself is not sensitive and can be handled without pain. The nerves supplying the dura are the recurrent branch of the fourth, branches from the ophthalmic, hypoglossal, sympathetic, filaments from the Gasserian ganglion and recurrent branch given off from the root ganglion of the pneumogastric nerve.

Etiology.—The etiology of extradural irritation may be classified under mechanical and infective irritants.

Under mechanical irritants we have foreign bodies, such as bullets, etc., adjacent to the dura. Fracture of the skull with depression of spiculæ of bone pressing against the dura. Extradural hemorrhage accompanying fractures is very frequent. Absorption of the blood clot without infection will leave a deposit of lime salts on the dura, according to Dr. C. C. Rogers, having the feeling and appearance of sandpaper, and causes very severe headaches. Decalcification and swelling of the skull bone, due to altered internal secretions, may irritate the dura, providing the bone thickens or swells and pushes blood and lymph vessels to the dura.

Under infective irritation of the dura we have acute and chronic purulent infections of accessory sinuses of the nose such as the frontal, ethmoid and sphenoid sinuses, as well as suppurative infections of the middle ear—that is, the tympanic cavity, attic, mastoid and mastoid antrum. Cholesteatoma of the above mentioned structures produce only mild symptoms of extradural irritation.

Infection of extradural blood clots will form an extradural abscess. Infective irritants are usually extradural abscesses, but I have had a number of cases where there was granulation tissue on the dura opposite a mastoid antrum chronic supuration, without the formation of free pus. In reality it is an extradural abscess, which is explained by the fact that the drainage through the ear was sufficient so as not to push the pus into the extradural space. The tegmen in these cases is usually necrosed, but granulations may appear on the dura

opposite to a chronic infection without complete necrosis of the bone. In other words, if the mucous membrane is diseased or lifted from the bone, the toxins may pass through the haversian canals and fissures on the bone, as well as along blood and lymph vessels in the dura.

Tuberculosis and syphilis of the skull or dura are well known etiologic factors.

Symptoms.—The symptoms depend upon, first, the amount of pain the patient can endure from the mechanical irritation of the sensitive dura; second, the severity of the infection and the extent of the edema of the dura, and third, the degree of intracranial pressure.

In mechanical noninfective irritations of the dura, headache is the principal symptom. The pain is always localized in the same point and may radiate in all directions. By very hard pressure on the skull over the painful area, the pain may be greatly increased. The headache is increased when blood rushes to the head from mental exertion, after heavy meals, when fatigued, or at night when lying down. There may be mild projectile vomiting and dizziness during the paroxysms of extreme headache. The mind may be sluggish, and epileptoid spells may accompany the paroxysms of headache. The pulse, temperature and respirations, as well as the blood, are usually normal.

In the infective type of irritation, especially in acute cases, the symptoms are more pronounced. Acute mastoiditis or sinusitis are the most frequent cause. The discharge from the ear or sinus may suddenly stop or diminish, indicating that it may have ruptured into the extradural space. The headache, projectile vomiting and dizziness are more pronounced. The prostration is greater, although the patient may go about. He shows signs of sepsis. The mental symptoms are more pronounced in that the patient is indifferent to his surroundings. He may not ask for food, but if fed digests it. The patient is also slow in answering questions. When a large abscess or blood clot forms he may have hemiplegia and go into coma. The temperature frequently drops to subnormal, as low as 96.5, and lingers between this and 100, no matter if the temperature of the patient was 104 before the abscess in the mastoid or sinuses broke into the extradural space. The

pulse may drop to 50 or even less, depending upon the amount of intracranial pressure. The respirations may become as slow as 10 per minute in pronounced cases. The blood examination is almost without value, as there may be only a slight leukocytosis and at times an increase in the polys. Frequently the blood is normal. The blood pressure is increased. When the abscess makes enough pressure to loosen the dura a little further from the skull, the symptoms may suddenly become less severe for several hours only to reappear when the abscess becomes a little larger.

Extradural abscesses of otitic origin occasionally cause a paralysis of the external rectus of the same side, which occurred in three of my cases. Choked disc is occasionally found in patients with much edema of the dura or large extradural abscess.

Chronic infective irritation of the dura is due to chronic suppuration of the sinuses or mastoids. There is a chronic discharge from the sinus or ear, as the case may be, and the bone between these structures and the dura is necrosed so that granulations may be found on the dura. The bony wall may not be broken down, but the toxins may pass through the bone if the mucous membrane is diseased and form granulations on the dura. If the drainage is sufficient so as not to form an extradural retention of pus the symptoms of extradural irritation may be very mild. The pain is usually intermittent in these cases, depending largely upon the resistance offered to the pus in draining through the ear or sinus duct. It may be severe enough to keep the patient from work. On careful inquiry we find the patient has occasional spells of dizziness and mild manifestations of cerebral vomiting. The temperature lingers toward the subnormal, 97 to normal. The pulse is usually slow. Occasionally we find mental symptoms such as indifference to work or slow in answering questions. One patient of mine slept for thirty-six hours, waking up occasionally to eat and talk with his wife. Hard pressure over the area may or may not increase the pain, depending upon the strength of the bone over the area. If the patient is not operated upon, before death he will have a pulse of 120 instead of 50 and a temperature of 102 instead of normal, also respirations of 30 instead of 10, and the blood pressure 90

instead of 180. When this change has come about, it is too late to operate, as the patient will die.

The Abderhalden serologic test for intracranial lesions, as carried out by Dr. J. W. Retinger at the Durand Hospital for Infectious Diseases, seems to be of great diagnostic value. Dr. Rogers has had a number of cases in which Dr. Retinger made the Abderhalden test, and on operation Dr. Rogers found the findings of the Abderhalden correct in all cases. I have had the blood in one case tested by him in which he reported no lesions of the brain, but an irritation of the dura in the Braca's area on the left side, which corresponded to my diagnosis, and later I corroborated it by surgery.

Complications.—The complications are brain abscess, meningitis and thrombosis of the lateral or cavernous sinuses. If the abscess breaks very gradually through the dura and the toxins enter the subdural and subarachnoid spaces but become circumscribed, we have the symptoms of a leptomeningitis.

Treatment.—Extradural irritation, except when caused by syphilis, should be relieved by removing a plate of skull over the area involved. In mastoiditis accompanied with symptoms of extradural irritation I invariably expose the lateral sinus and the dura over the mastoid antrum. I expose both sufficiently to be able to make a thorough examination of the dura and sinus which at the same time establishes ample drainage.

In sinusitis of the frontal, ethmoids or sphenoid, I do a thorough intranasal operation and then keep the patient under close observation for a few days, taking the temperature, pulse and respiration every three hours. If the symptoms still persist, I do an external operation on the frontal sinus and remove the posterior wall as far as necessary to reach the abscess and thus expose the dura. The dura must never be opened in these cases, as going through an infected field would nearly always develop a meningitis.

VI.

CONTRIBUTION TO THE ETIOLOGY OF PERITONSILLAR ABSCESS: DENTAL ORIGIN.*

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Peritonsillar abscess is commonly considered to be of tonsillar origin. Some two years ago a number of cases came under my observation which strongly suggested an infection of a wisdom tooth as an origin. These cases had several characteristics in common. They were either accompanied or preceded by caries or inflammation due to delayed eruption and impaction of a wisdom tooth. In one case, that of a young woman, incision of the peritonsillar abscess admitted a probe which led to a sinus reaching to a subperiosteal cavity situated at the angle of the mandible. Another common characteristic was the location of the abscess. The pus collection did not point in the supratonsillar space but rather in the region of the base of the anterior pillar and somewhat lateral to it. The cases were also characterized by an excessive trismus, the patients being quite unable to separate their teeth at all. On attempting to open the mouth they would merely separate their lips, disclosing tightly shut teeth, between which it was barely possible to introduce a tongue depressor. Attempts to force the jaws apart were frustrated not so much by pain as by a muscular contraction, and the examination had to be conducted through the vestibule of the mouth.

This picture is not usually presented by the typical cases of peritonsillar abscess with typical localization in the supratonsillar fossa. In such cases the patients are unable to close their teeth firmly or to separate them widely, and they, there-

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fore, keep the mouth partly open with saliva dribbling constantly.

An attempt was made to secure data of the incidence of peritonsillar abscess with regard to age, in order to determine whether it in any degree coincided with the period of molar dentition; also as to the frequency of peritonsillar and tonsillar inflammation in the negro, since, as is well known, the greater development of their lower jaw renders them quite free from the accidents of molar pathology due to impaction and delayed eruption; also, the relative frequency of peritonsillar infections in the different sexes. This inquiry was not fruitful of results, owing to the fact that little could be found in the literature upon the subject. Hospital records were equally unilluminating. An attempt to obtain radiograms of peritonsillar abscess cases similarly yielded meager results, for the reason that no such studies were found in the literature or in hospital records available. Left to one's own resources with no X-ray laboratory available for clinical study, but a scant number could be obtained, too few to be of any value in this study.

I have made notations of a series of seventy-five cases of peritonsillar abscess. They were seen in private practice and by colleagues and myself at the infirmary. In few of them could a detailed history be secured. These cases usually present themselves at the height of their suffering. They have spent many sleepless nights, they have been unable to take any food for days, they are in constant pain radiating to the ears, teeth, throat and back of the head. They are unable to speak and cannot be questioned. All that can be done is to incise the abscess promptly and to evacuate the pus, and then the patients usually disappear as suddenly as they came, frequently without leaving any trace. However, the following data have been adduced: Fifty-nine cases were treated at the infirmary from 1915-17. Of these, forty-eight were males and eleven females.

As to age, there were in the first decade five, or 9 per cent; in the second decade, fourteen or 24 per cent; in the third decade, twenty-eight, or 50 per cent; in the fourth decade, nine, or 15 per cent; in the fifth decade, two, or 3 per cent;

in the sixth decade, one, or $1\frac{1}{2}$ per cent. About 75 per cent of the cases occurred in the second and third decades of life, a period fairly coinciding with molar dentition, and the maximum of prevalence being in the third molar period. Of the sixteen cases seen in private practice, twelve were females and four males; all but one were between the ages of fifteen and thirty, or 95 per cent in the period of wisdom tooth eruption.

It may, of course, be truthfully argued that the period indicated is also characterized by the prevalence of tonsillar infections which are the accepted source of the pathologic process. It will not be sufficient to say that the curve of tonsillar infections reaches its highest point in the first decade of life, whereas, that of the peritonsillar infections reaches its highest point in the third decade of life. This is true only of acute tonsillitis. The chronic cryptic forms really attain their greatest prevalence in the third decade of life, and it is the chronic cryptic forms that are concerned with the etiology of peritonsillar inflammations.

The figures quoted above need not be necessarily without significance, especially if borne out by more extensive statistics. Three out of sixteen cases, or 20 per cent, were unmistakably of dental origin. One, a woman of thirty years, with caries of a last lower molar, had a large abscess displacing the right tonsil, involving the parotid and cervical glands and pointing outwardly below the angle of the jaw. Another case followed the extraction of a lower wisdom tooth. The patient presented herself with marked trismus. The examination had to be made through the vestibule of the mouth, which was somewhat facilitated by the absence of another molar in the upper jaw. Partly by inspection and partly by palpation with the finger and probe a fluctuating swelling was discovered dislocating the right tonsil towards the midline, and presenting anteriorly between the missing molars. An incision was made close to the ascending ramus in the direction of the angle of the jaw and pus evacuated. In another case, after evacuating the abscess, a sinus led to a subperiosteal cavity at the ascending ramus, which could be explored by a probe. Five other cases, or 33 per cent, had carious wisdom teeth and gave a history of previous attacks of alveolar ab-

scess. In over 50 per cent of the cases the dental etiology seemed to be either a principal or a contributing factor.

Moritz Schmidt finds peritonsillar abscess more common than the tonsillar. He gives accumulations in the tonsil crypts first place in the etiology; next, streptococcic invasion from badly suppurating teeth. Koehler finds a suppurating wisdom tooth the most fruitful cause of abscess in or around the tonsil. Cryptic accumulations come next in his opinion. Sokolowsky and Dmoschowsky point out that peritonsillar as well as tonsillar abscess occasionally follows operative procedures on the nose, irrespective of antiseptic precautions. Of special interest is their assigning chronic suppurative otitis media as a causative factor in tonsillar and peritonsillar inflammations, particularly of the recurrent type. Such patients will sometimes give the history of a nauseous sweetish taste in the mouth caused by the pus of the middle ear reaching the pharynx by way of the eustachian tubes and in this way infecting the tonsils and peritonsillar region. Victor Lange, of Copenhagen, considers simple angina as a most frequent cause of tonsillar and peritonsillar affections. For early diagnosis the author points out that rapid development, unilateral involvement, early and extensive edematous infiltration of the uvula and anterior pillar herald the development of peritonsillar abscess. Early appearance of edema points to deep seated inflammation with congestive phenomena. The abscess is usually contained in the anterior pillar. It may also occur posteriorly. Occasionally the pus is discovered above the last lower molar. Casselberry considered chronic cryptic tonsillitis as the usual cause of peritonsillar abscess and calls attention to its frequent association with a hereditary rheumatic habit and not infrequently with acute rheumatism.

Owing to the paucity of material gleaned from the literature and owing to lack of facilities for anatomic, clinical, bacteriologic and radiologic study, the writer for a long time lost interest in the subject. Recently, however, there came to his attention an extensive and elaborate study in a French dental journal, *Odontologie*, volume 41, by M. A. Gibert, of Carmeux, entitled "L'abcès périostique juxta amygdalien odontogene." Here, at last, seemed to be found something pertinent to the subject. After citing observations similar to those

referred to, the author differentiates between peritonsillar and juxtatonsillar abscess. To the latter he assigns an almost invariably dental origin. Juxtatonsillar, I believe, may be rendered in plainer English as paratonsillar. We have therefore to distinguish, according to this author, between peri- and paratonsillar abscess.

The principal anatomic landmarks forming the basis of this distinction are the internal pterygoid muscle and its insertion in the ascending ramus of the mandible. Medially this muscle is in relation with the superior constrictor which in turn is in relation with the tonsil. The pterygomaxillary ligament is the common origin of the buccinator and superior constrictor muscles. A tract of cellular tissue connects the pterygo-mandibular and pterygoconstrictor spaces and brings them in relation with the prestyloid region. (Fig. 1 and 2.) Laterally the internal pterygoid is in relation with the dental artery and the dental and lingual nerves. (Fig. 2.) A peritonsillar abscess is located between the tonsil and the superior constrictor. It is of tonsillar origin and principally the superior pole of the tonsil which contains the largest and most submerged crypts is the most frequent source of infection. The pus therefore collects in the supratonsillar space, for the added reason that in that portion the tonsil is least firmly attached to the surrounding tissues. The paratonsillar abscess, on the other hand, is of wisdom tooth origin. The space delimited by the insertion of internal pterygoid and ascending ramus of the mandible is considered by this author to be in a state of enhanced susceptibility to infection, on account of congestion and physiologic proliferation incident to delayed eruption, impaction and caries of the last molar, and sometimes of the second and first molar, observed in the white race. The situation of the third molar within the ascending ramus in the Europeans favors the extension of a wisdom tooth infection in the direction of the periosteum of that portion of the bone and frequently develops in a phlegmonous periostitis. Such an abscess is situated between ascending ramus of the lower maxilla and the internal pterygoid muscle. As the collection expands it pushes the internal pterygoid against the superior constrictor and thus the tonsil is displaced towards the median line of the fauces. At the same time the abscess grows for-

ward and points in the region of the pterygomaxillary ligament which presents itself as a soft red cushion at the intermolar angle and thus marks the site for the therapeutic incision. (Fig. 3.)

The abscess thus situated is in relation above with the parotid gland and temporomaxillary articulation which it may involve. It is also in relation with the dental and lingual nerves. The abscess may also extend by way of a cellular tract around the anterior border of the internal pterygoid, invade the cellular space between the latter muscle and the superior constrictor and thus also reach the prestyloid region. Very rarely the pus may burrow towards the mouth and pass through the tonsil. It may also burrow over or under the mylohyoid muscle and provoke a phlegmon of the floor of the mouth or anterior part of the neck, leaving quite frequently one or more fistulæ which persist for a long time.

It is thus seen that this condition, starting from a carious or impacted last molar and acting upon a region of physiologic predisposition to infection, results, first in a limited phlegmonous periostitis which by reason of the peculiar relations may progressively involve the entire side of the neck and face, presenting a combination of many lesions, a peritonsillitis, parotitis, temporomaxillary arthritis and phlegmonous adenitis. From these conditions it is to be differentiated according to the author, by adducing a history of premonitory dental pain, followed by an interval of quiescence, then by the development of a periosteal inflammation of the ascending ramus involving the bone and early giving rise to maxillopharyngoglossodental pain, through the involvement of the dental and lingual nerves, to dysphagia and to a marked trismus which cannot be relaxed by chloroform. Later the pointing of the abscess above the last lower molar corroborates the dental origin.

Résumé.—The object of this thesis is to call attention to the significant relation of the period of wisdom tooth eruption to various tonsillar and peritonsillar infections and to present the very interesting differentiation by Gibert of peri- and paratonsillar abscess.

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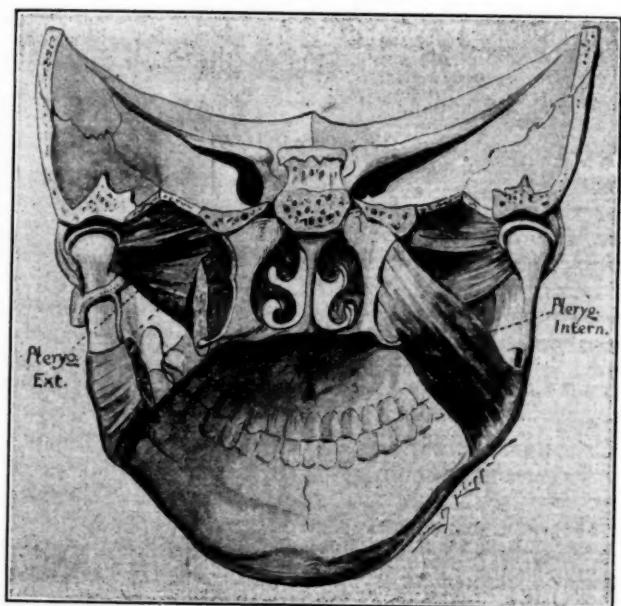
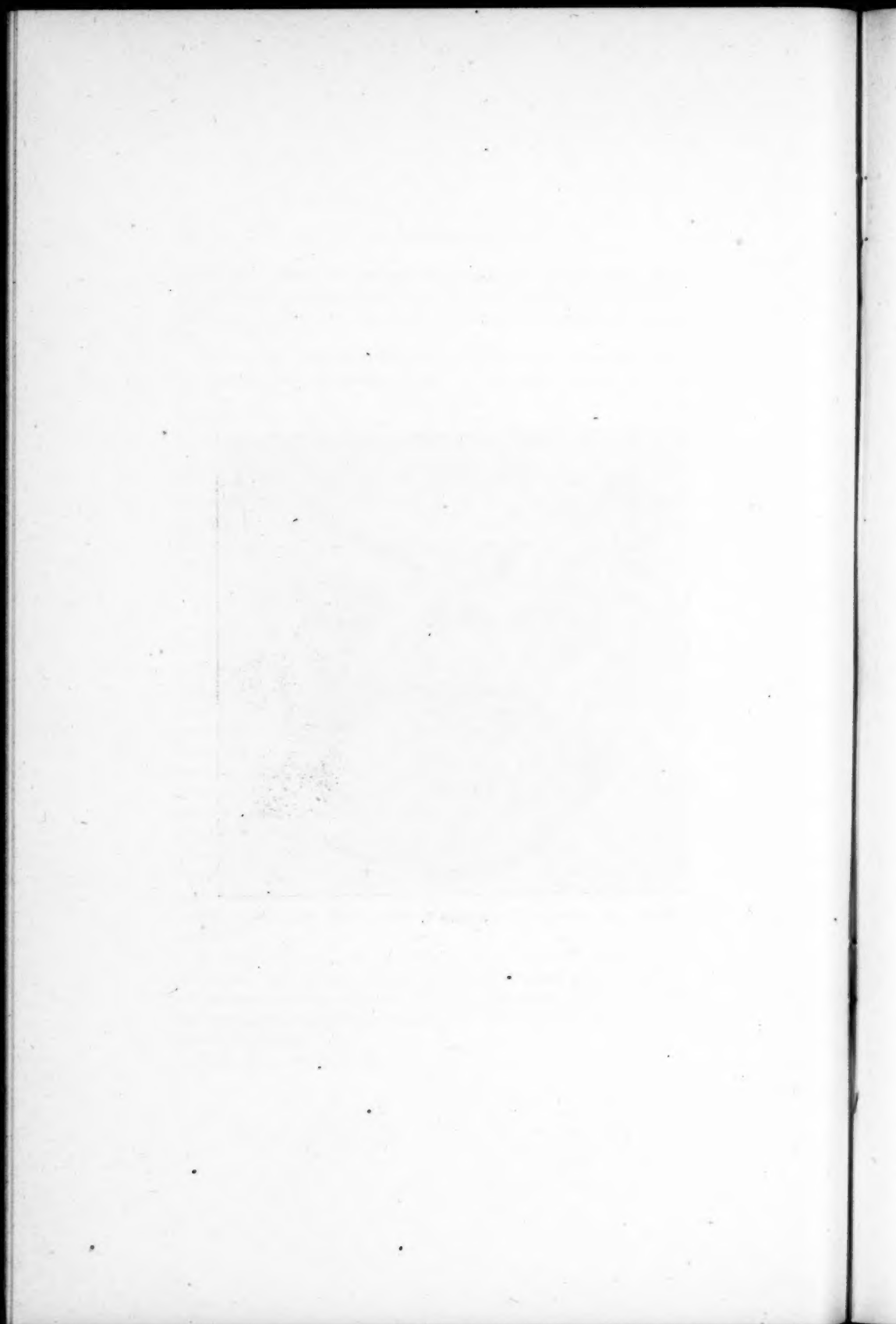


Figure 1.



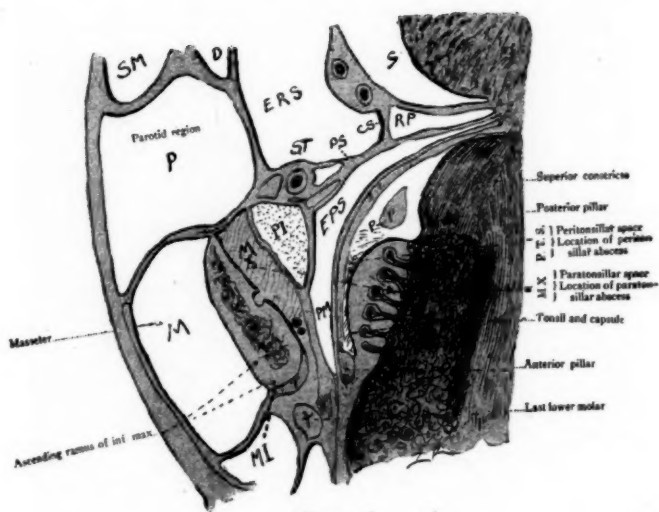
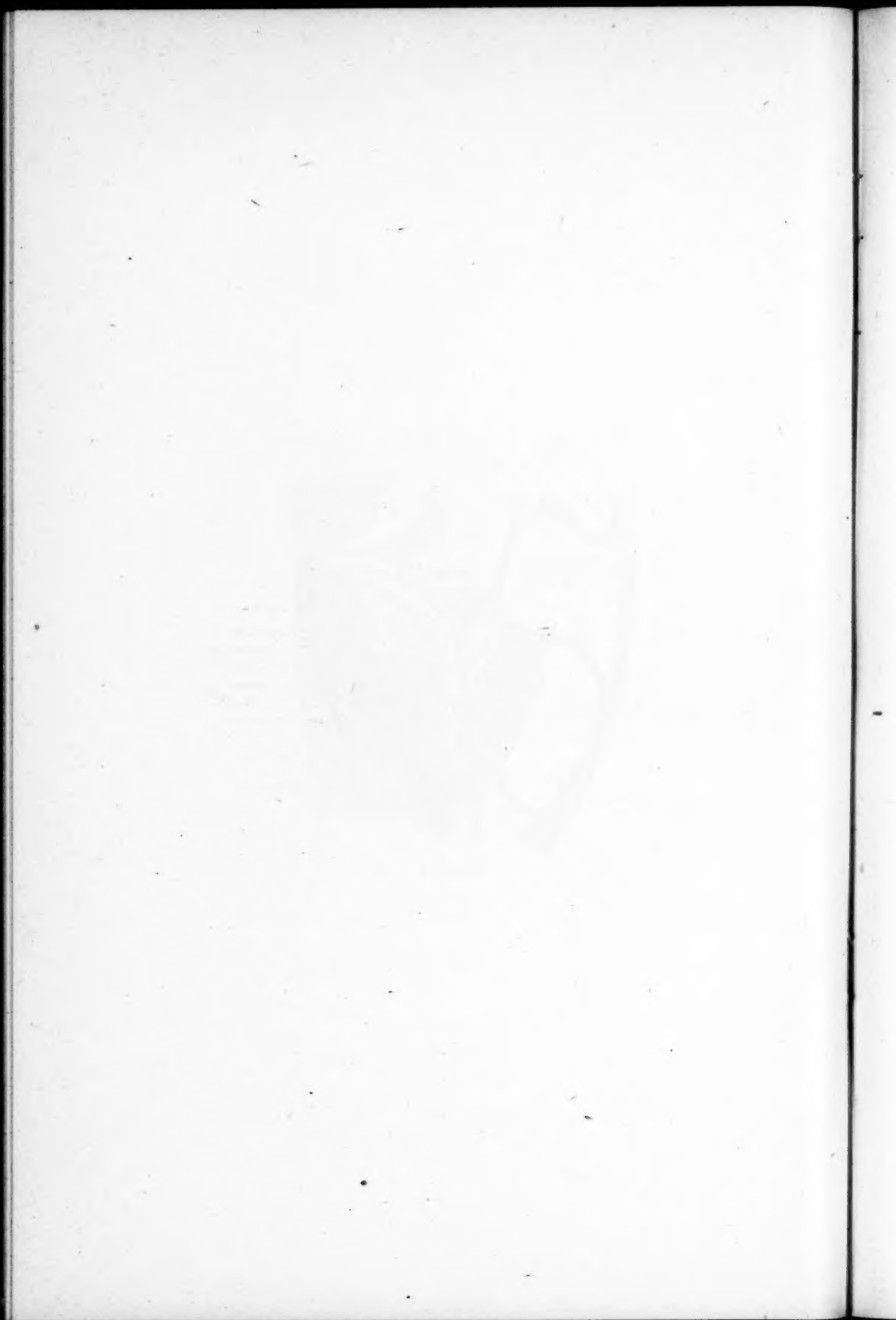


Figure 2.



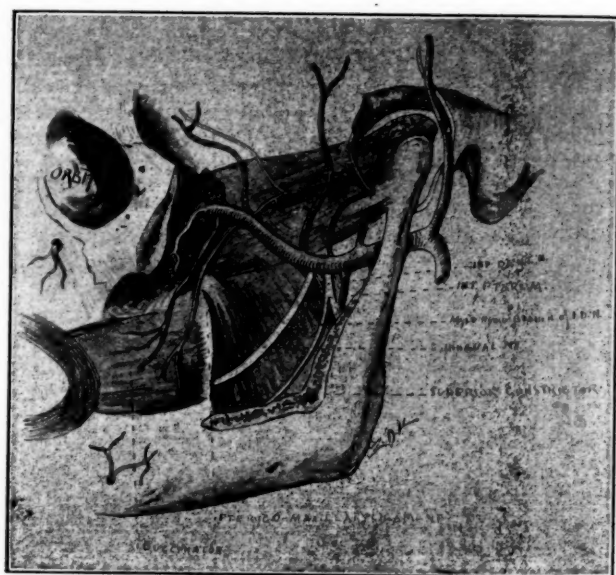


Figure 3.



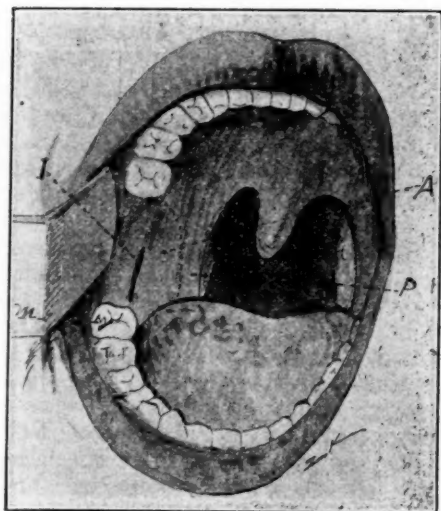
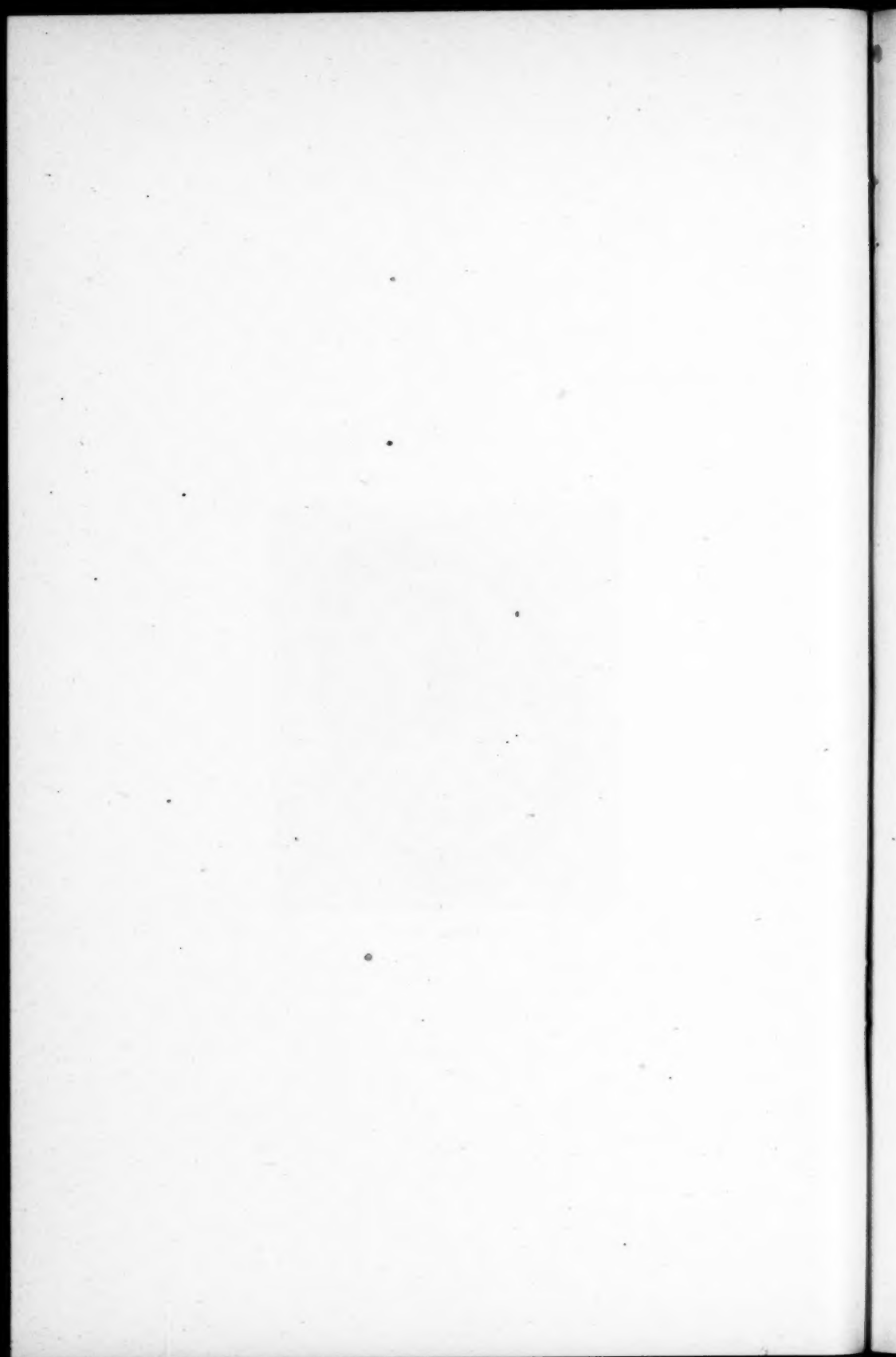


Figure 4.



VII.

RECURRENT CALCULUS OF THE TONSIL. REPORT OF A CASE.*

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Take it all in all, calculus of the tonsil has been, in the experience of the writer, not of very frequent occurrence. The cases I have met have been without any special symptoms other than slight soreness or disturbance in the tonsil, and in looking through the crypts of the tonsils carefully I have, by merest accident, discovered the presence of the concretions and removed them. Such calculi may be no larger than the average allspice, and several that I have happened to take out have been similar in appearance, possessing rough surfaces, some of them quite corrugated, like the one that will go around in the box with the larger specimens, and these have been correspondingly difficult to remove on account of this rough exterior.

The case which forms the basis of the report came to see me first in the year 1904. She said that some ten or fifteen years previously—as a matter of fact, in the year 1890—she had consulted Doctor Chapman (who was a member of this society) and that he had removed from her quite an accumulation, from the right tonsil; and she said that she thought her symptoms now were similar to what they were at that time.

She evidently was suffering a good deal of pain and discomfort; the glands in the neck were somewhat enlarged and tender; and it certainly hurt her to swallow, quite exquisitely. She was a woman then of fifty-seven years of age, small of stature, and had otherwise nothing in her history that was remarkable as bearing upon the present ailment. She was not subject to serious attacks of sore throat, except as at present, and the previous one when Dr. Chapman saw her.

*Read before the forty-first congress of the American Laryngological Association, June 16, 1919.

On looking into her throat I found the right tonsil apparently covered with a gray exudate. The tonsil was very much swollen, very red, the anterior of the pillar of the palate being edematous. On wiping off the gray exudate from the surface with peroxid, my cotton caught in what proved to be the calculus. Immediately I discovered what it was, and after cocaine-ization proceeded to remove it. It was composed of three fragments, which have been held together by threads in order to show the relative positions that they occupied, and to get a good photograph.

With effort I was able to remove the first fragment, the one to the left, as they are now bound together. Considerable bleeding followed it, and in spite of the cocaine the pain was considerable. After the bleeding has ceased, to my surprise there was a second piece visible, and the third came to light later on and was also removed, the rough surfaces being very tightly, closely and intimately imbedded in the substance of the cavity wherein they were located. This made it very difficult to get them out, and the bleeding which followed was not inconsiderable. It occurred to me, as I talked with the patient while waiting for the bleeding to cease, that, as she had had a similar concretion, which was not an inconsiderable one, removed fourteen or fifteen years previously, there might be some connection between the lining membrane of this sac and the production of the calculi, the idea having been impressed upon me in a way similar to that in which the biliary calculi form in the walls of the gall bladder. I therefore especially requested the patient to come back as soon as she could, in order that I might have a chance to more carefully examine the lining of this sac, than I was able to do then on account of the bleeding. The patient was instructed to use simple saline gargles, and to report not later than a week. She carefully forgot the latter part of my instructions, and I did not set eyes on her again at that time. Having forgotten her name, by one of those slips that occur in the life of a busy practitioner, I was not able, by writing to her, to urge her to come again and thus settle in my mind the cause of the trouble.

I saw this patient again on the 22nd of July of^alast year, after fifteen years, an exceedingly hot day, when she had reached the age of seventy-two, and was in physical condition

to be very much depressed by the heat and the exertion of getting in to see me. She seemed very frail and was suffering a good deal of pain. Recognizing her immediately as she came in, I said, "Well, have you got another stone for me?" She said, "I think so, Doctor," and she was right. I looked in her throat, and asked her how long she had been aware of the present accumulation, which one readily saw in the same tonsil and in the same pocket where the previous one had been. She said that for the last two months she had been gradually having more and more pain, until now it seemed as though she could not stand it any longer, and she had to come in. Anyone who saw her throat would agree that she had certainly borne up bravely under the torment, and the impression that one received on looking into the throat was that he wanted to be careful that the stone did not fall out while he was getting the instruments ready to properly remove it. But mindful of the rough surface which held the previous one securely in place, I carefully applied the cocain again, with plenty of adrenalin, applying both, in order, if possible, to forestall a hemorrhage, and then was able to remove it this time as a single stone. The cavity again bled profusely, in spite of the substances applied, and I again found nothing but a rough, bleeding, granulating surface, to which I applied some ferripyrin, and again besought her to put in an appearance before many days—in fact, gave her an appointment for exactly one week from date, as on the next day thereafter I was going on my vacation.

She asked if she might take the stone home with her, and I told her if she would be careful to preserve it in its integrity and be sure to return it when she came back in a week, I would gladly let her take it. Asking her why she particularly wanted to take home this specimen when she did not express any desire to take home the previous specimen, she said her folks thought she was making an awful lot of fuss about her throat and she wanted to take it home and show them what she did have there.

I was glad to have her show her friends and relatives that she was a sufferer from a genuine error and not a delusion, and she then related to me that I was right in thinking that she did not feel well that day. She said she had not been able

to have any help this summer on the farm, and before coming over she had gotten up and milked three cows, done the chores about the place, and then hitched up her horse and driven six miles so as to get to the station in time for the train, and she "did feel kind of tired that afternoon, she was sure." She also related what is perhaps more interesting from a scientific standpoint, that in the year 1910 she had brought forth another stone, while in the Hartford hospital for an operation for gall stones. This specimen I have not been able to find, although the patient, after seeing both of them, says it was similar in size and shape to the one last removed.

The patient again carefully forgot my instructions to return in a week or to bring in the stone, and I went away on my vacation as scheduled. On returning in September, I wrote her that I would like the stone at least, and would like her to bring it in, in order that I might see how the cavity looked. By that time the tonsil had returned to normal proportions, which consisted of a very thin layer of lymphoid tissue lining the right tonsil fossa. The cavity which had been occupied by the stone was smooth and intact, and presented nothing peculiar about its surface to distinguish it from any other tonsil crypt of a woman of her age. There was no evidence of calculus formation here at this time, although the cavity did contain a little of the ordinary cheesy secretion which one finds in old tonsils. She rather wisely concluded that if she did not have these things occur oftener than once in eight, ten or fifteen years, she would not require a complete tonsillectomy or other form of treatment, and that if ever she got another one of these accumulations she would be only too glad to have me add it to my collection. And so the history of the case ceases for the present.

Whether in years to come I shall have the privilege of bringing before you another specimen remains to be seen.

In these specimens, as you see them, certain crumbs have broken off, and their study seems to show nothing different from the usual combination of phosphates and carbonates that one finds in calculi that occur in the mouth and salivary glands.

In commenting on this report it is perhaps worth while mentioning that while larger—much larger—calculi have been re-

ported, these particular specimens are so large that they outstrip any of those usually found. The first one removed is peculiar in that it is composed of three parts which, by the act of swallowing and other motions of the tissues surrounding them, have had the contiguous surfaces smoothed off into facets exactly like those found on gall stones.

The fact that this patient had also biliary calculi is interesting, as indicating the tendency of her secretions to give up their salts to make solid concretions, explaining in a way the occurrence of at least four of these large masses in her case.

If ever another case should occur of a "repeater" of this type, two ways suggest themselves to dispose of such a tendency, either to destroy the living of the cavity or pouch in which they reform (as I wished to do for this patient, only she rejected the offer) or to do a complete enucleation. This second alternative would dispose of any tendency to return.

Perhaps, after all, as we contemplate a mass of the size of these before us, its greatest interest centers around the possibility of unexpectedly meeting such a hard substance when operating where the stone is entirely concealed in the midst of the tonsil tissues.

In the days long past, in the good old days of the tonsilotome, such a stone would have been most disturbing. Only once did I meet such, and then cut through squarely a small accumulation. Operating by the present methods would cause but little trouble, because the dissecting wire of the snare would usually—perhaps always—go outside the mass, as it shells the tonsil out of the capsule.

If we should meet the rare but by no means to be ignored complication of an elongated styloid process, I imagine that it would likewise either be chopped by the snare, or again, the latter would glide off from it.

I have sometimes wondered if the smaller stony masses may not lead to abscess formation. I once found gritty material in a small abscess in the tonsil substance proper where there was no history of an immediately acute process to account for a quinsy, and I can conceive of an infection forming an abscess in the area irritated by the presence of a stone. Then in the pus thus formed a friable stone could readily become dis-

solved or broken up, a thing which presumably occurs in the case of salivary calculi of small stature.

In the case of this particular patient, I presume that if she could have longer endured the pain and soreness, ultimately these concretions would have fallen out into the mouth, readily being swallowed, unless by choking inspired into the trachea.

Even Dr. Jackson's extensive collection of foreign bodies in the bronchial tree, I presume, does not include such an intruder, effectively disposing this hypothesis; for what Jackson has not found, indeed, is well nigh unheard of.

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VIII.

SYPHILIS AMONG THE NEGROES OF AFRICA AND ITS MANIFESTATIONS IN OTORHINO- LARYNGOLOGY.*

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The study of syphilis in Africa is particularly interesting, as it shows that this affection—previously unknown among the negroes of this country—has been transmitted to them, at different epochs, by the Egyptians, the Arabs, the Berbers, the Europeans and the Hindoos. Besides, its manifestations among them are very irregular, as at certain places the symptoms are almost imperceptible, while at others they take a very serious character.

An extended trip around the Dark Continent, where I had the occasion of visiting twenty-two different colonies, some of them located far away from the coast, has given me the opportunity of examining five thousand negroes, and it is the result of my observations that I want to mention briefly. In general, there is no syphilis among the natives who live in the deep forest or at places unfrequented by travelers, but it is very common on the north and south and on the eastern and western coasts. The aborigines, to whom this terrible affection was unknown, have given it different names, and the Zulus of the Natal have called it "the white man's disease."

As I have already said in a previous paper,¹ much has been written about the origin of pox. However, it is not my aim to sum up the different theories here; I will content myself with merely stating the principal ones in connection with the subject I am treating.

*Read before the *Congres Francais d'oto-rhino-laryngologie*, Paris, May, 1919.

According to the opinion expressed by Sydenham, Haller and later by Sprengel (1796), Africa was the primary center of syphilis, which next came to Europe. In my opinion, this hypothesis is incomplete for, if I am ready to accept it in part, I must reject it as a fundamental idea. Indeed, it is generally admitted that Asia was the cradle of this affection, and that it existed in the East Indies from a very early date. The Ethiopians, and above all the Egyptians, in daily contact with the people dwelling on the coast of the Red Sea, and the Levant, were naturally all exposed to the contagion. Moreover, the first Arabian conquerers, syphilized for a long time back, established themselves definitely in Northern Africa during the seventh century, by repulsing the Berbers or by mingling with them. In 711, the Moors invaded the south of Spain, which they occupied for more than seven hundred years, and during this period bands of natives were constantly crossing the Strait of Gibraltar.

In Europe, we can say that the history of pox dates chiefly from 1493, the epoch at which Christopher Columbus returned from his first voyage to America. I will not discuss the opinions expressed on the probabilities of the importation or exportation of this disease by the sailors of the intrepid Genoese navigator. I will content myself with merely recalling that in South America the specific lesions have been observed in the skeletons of Indians who inhabited the country before the Spanish conquest. Moreover, as I have already intimated in another article,² to me the Redskins are Mongols who crossed Bering Strait and peopled this vast continent. And besides, it is admitted that the Chinese have been syphilitic for an indefinite period.

As we have been able to note, the negroes have not yet been brought into the case, and it is necessary to consult the most recent works in order to find a more precise hypothesis. Mühry (1856) thinks that syphilis was imported from tropical Africa to Portugal in the fourteenth century, during the reign of King Henry the Navigator. I am unable to share this opinion, because, in all the Dark Continent it is exactly in the periequatorial region that syphilis is least common and its hereditary manifestations are exceedingly rare. Moreover, in the great forest this affection was unknown before the arrival

of Europeans. Without going further into details, I think that the long sojourn of the Moors in Spain, driven from Andalusia in 1492 by Ferdinand and Isabella, has contributed largely toward syphilizing this part of Europe, even before the return of Columbus.

I believe that in Africa syphilis appeared first in the northern part, and that it has been imported from Asia. The Arabs and the Berbers contaminated the Moors of Mauretania, and these infected the blacks of the surrounding countries. From the mingling of the negroes with the Fellahs of Egypt were born the Peuhls, who inhabited the region of Upper Senegal-Niger, and the Foulahs, who are met with especially at Fouta-Djalon in French Guinea. In the British colonies these Foulahs, called Fellanies, brought under their domination the powerful tribe of the Haoussas, who lived in the northwestern part of the English Nigeria. These, in contact with their victors, were not long to take the pox. Also, these Haoussas, these Foulahs-Fellanies and these Peuhls, who were extremely syphilized and always traveling, transmitted their disease in all the places they went.

Syphilis has been imported in Abyssinia by two different ways: first by the Egyptians, always at war with the Ethiopians, and next by the Arabs of Asia. These Arabs, coming from Yemen, invaded Erythrae and the Somali Coast, and going south they took possession of Harar, the capital of the country of the Gallas, where they remained during a very long time. Their civilization has left certain customs, which are still found there today. H. Blanc thinks that the Ethiopians were contaminated by the Portuguese during the fifteenth century. Surely at this period syphilis already existed in Portugal and had also, for a long time back, shown itself in Ethiopia.

English East Africa was infected chiefly by Hindoos, who are also met with in Zanzibar and in Natal.

Portuguese East Africa and Angola were contaminated by the Portuguese, and especially this last colony, which is possessed by them since over four hundred years.

The blacks of South Africa have been syphilized principally by the soldiers who have taken part in the wars of that country. The comparatively recent British-Boer war was one which brought about the greatest ravages in this respect. There

is no reason to be astonished at this, for it is an acknowledged fact that amongst all the European troops the British army is affected by venereal diseases to an extent three times greater than other armies, and particularly by pox. Moreover, history teaches us that in all times, armies have been one of the principal agents that have spread this affection.

The great mining centers are infected not only with syphilis, but also with tuberculosis, and the Kaffirs, although of robust physique, succumb to phthisis with disconcerting rapidity.

Researches concerning pox amongst the Hottentots and the Bushmen would have been of particular interest. Indeed, as I have already written in a previous paper,^a these two tribes, which have now become almost extinct, have in their veins a certain quantity of Mongol blood, and it is recognized that the yellow race is strongly affected with this malady. Unfortunately, these two peoples, owing to their timid and unsocial character, do not comply themselves for examination, and as they dwell on the frontiers of German Southwest Africa, in Portuguese Angola, and on the frontiers of the surrounding British colonies, it is very difficult to reach them and make a study of a sufficient number to form an opinion.

For quite a number of years now, Europeans have divided between themselves practically the whole continent of Africa, and with the construction of railways and the organization of steamboat services, it is an easy matter for the natives to travel from place to place and communicate the diseases by which they are affected. The negro soldiers who constitute the native forces, when they are transferred from one colony to another of the same country, obviously add to the danger of contagion if they are syphilitic.

And now if, in addition to all that I have described, I mention the scattered cases of pox transmitted by Europeans not yet named, we are forced to admit that the malady was introduced into Africa at numerous places and at different periods.

As already remarked, I have, in another communication, exposed the pathology of the eye due to syphilis amongst the aborigines of Africa. In the present paper I propose to treat of the manner in which this disease affects the nose, the throat and the ears. During my sojourn on the Dark Continent

I had opportunity to observe one hundred and thirty-five cases of pox, the different manifestations of which I found very interesting. In the first place, I was struck by the mildness with which the affection attached itself to certain races as compared with the extreme gravity with which it attacked other tribes. The Moors of Mauretania, the Peuhls, the Foulahs-Fellanies and the Abyssinians, who were infected several centuries back, very seldom show lesions on the bones, whereas an injury of this character is frequently observed amongst negroes who have been more recently syphilized. In a general way, the negroes are very neglectful in taking care of themselves, or do not treat their maladies, and amongst the former very slight treatment usually removes the symptoms of the pox. Hence I believe these negroes, contaminated many generations ago, now possess a certain degree of immunity against syphilis, which explains why this affection is so appreciably attenuated amongst them. Moreover, I have made similar observations amongst the Chinese and the Redskins of South America, who, although infected ages ago, have now very mild specific manifestations of the disease.

According to Livingstone (1857), there was no form of pox persisting amongst the pure blooded native races of Central Africa; on the contrary, it showed itself amongst populations of mixed breeds. Certain authors are inclined to believe that if this fact could be verified by prolonged observations it would force an admission that immunity belonged much more to the race than to the climate. For myself I have to note that this Scotch missionary was impressed by the considerable number of syphilized mulattoes who were to be met with in the large cities of South Africa. Once in the interior of the country, observing that affection no longer, he concluded therefrom that the negroes living in the center of the Dark Continent were more or less refractory and that syphilis was invariably cured without leaving any trace. I will not delay to say that this is not so with the pox in its ordinary course. That malady did not exist amongst the negroes of the great forest before the arrival of the first European explorers, and even now it is very rare. With regard to immunity, I accept what has been submitted, and I do so all the more voluntarily because it forms part of my theory, but only amongst syphilized peo-

ples for several generations past. Furthermore, I believe immunity can be met with among all nations, and the climate has nothing to do with it.

The milder form of syphilis, none the less, is terrible in its menace to foreign races that have not been contaminated. When those races become infected the manifestations develop with great recrudescence. Europeans particularly are exposed to the bad effects of pox contracted outside their own country, especially if this affection is taken in Africa, Mexico or in China. I have seen at Konakry, in French Guinea, a large number of Soussous, who were syphilized by the Foulahs after the construction of the railway line which runs from the coast and traverses the Fouta-Djalou, showing large perforations of the palate and of the nasal septum. Amongst other subjects, the pox made its presence felt on the larger bones, notably the tibiae. These Soussous, a race primitively healthy, suffered to a very large extent from contact with their neighbors, the Foulahs. The same phenomenon attracted my attention amongst the Yorubas and the Egbas of Nigeria, who were infected by the Haoussas, and amongst the Somalis, who are commencing now to be contaminated by the Ethiopians, owing to the railway which enables them to reach Abyssinia easily.

Among the one hundred and thirty-five cases of syphilis I am speaking of, I found seventeen perforations of the nasal septum, nine perforations of the palate, and twelve patients which presented the two symptoms at the same time. Twenty other cases had lesions on the bones. I will not delay to describe the alterations, more or less considerable, of the mucous membrane of the mouth in the second stage of the pox, as these present no interest.

The mucous membrane of the larynx is very resistant to infection, and I have observed only two cases of specific laryngitis. As to tuberculosis and cancer, it is exceedingly rare to see these maladies invade that organ.

I have never found paralysis of the vocal cords or of the velum palatum, for the negroes are not inclined towards syphilitic nervous manifestations, cerebral or spinal. As they have no intellectual preoccupations, and they live a very simple material life, the pox localizes itself amongst them principally on the bones and mucous membranes. Perspiring free-

ly and being constantly exposed to the sun, with very little clothing, their irritated skin is also often affected.

Before proceeding to discuss the question of the ears, I wish to say a few words about a singular malady that has been encountered in the Belgian Congo called "Mulandala" by the natives who, in the region of Kasai, suffer very severely from the complaint. Dr. Yale Massey, of Lusambo, informed me that he had seen, on a man forty years of age, and a woman, thirty-five years of age—both belonging to the tribe of the Balubas—a large perforation of the palate, and the complete destruction of the nasal septum, without other complications. A most attentive and thorough examination was made, but the doctor was not able to ascertain the cause of the affection. A biopsy was made, but the microscope revealed nothing particular, except inflammatory lesions. Mercury, iodid of potassium and arsenic, prescribed in large doses, produced no effect, and both negroes died of cachexia in the same year that the malady developed.

It appears that in Nigeria the same disease, called "Majakara" by the negroes of that country, was seen also amongst the Jebous. It seems to attack people mostly between twenty-five and forty years of age. Mercury, iodid of potassium and arsenic were likewise administered in these instances, but without effect, and the disease progressed until the patient's death.

It would be difficult to submit an hypothesis as to the probable cause of this affection. Syphilis, tuberculosis, malignant tumors of the palate—about which I have already made one observation⁴—actinomycosis and leprosy are too well known to have appeared without being recognized. The microscope having revealed nothing special, and the medicaments prescribed having caused no amelioration, it has to be admitted that we are in the presence of an affection the etiology of which we do not yet know, as, for example, that of "Goundou," which I have seen and operated on in the Ivory Coast and the Gold Coast, and of which I propose to treat in a subsequent work.

At the time of my physiologic researches regarding the organs of the senses amongst the natives of the Dark Continent, I was impressed by the excellence of their sight and hearing. Their osseous and aerial perception is much su-

perior to that of white people, and the Redskins who, in my opinion, belong to the yellow race, occupy an intermediate place.

The pathology of the ear amongst the negroes and Indians is not very extensive. I have observed but very rare cases of deafness having been produced by otitis sclerosa. I may also add that the arteriosclerosis amongst the two peoples is exceedingly rare. However, the mulattoes and the half breeds are just as subject to deafness as white people.

In Africa otitis is met with from time to time, and the malady varies as the places are more or less cold. Proportionately, infection of the middle ear causes mastoid complications more often among Europeans than among negroes. This phenomena is probably due to the anatomic fact that the eustachian tube of the negroes is larger than that of white people, and owing to that fact the ear has a better chance to empty itself.

I never saw any lesions of the labyrinth, either syphilitic or any other kind, and although the natives frequently suffer specific inflammation of the bones, their temporal bone never seems to be affected.

To sum up, I shall say that Africa was not the primitive cradle of syphilis. In the beginning, that malady was imported from Asia and propagated among the people who dwelt in the north and northeast of this continent. The people who lived on the coast of the Mediterranean then contaminated their neighbors to the south, namely, the negroes. Later, and at different periods, the pox made its appearance in other parts of Africa, starting at the coast.

Europeans are largely responsible for the invasion of pox in their respective colonies, and chiefly those who have been often at war.

A number of tribes that were first affected several centuries ago seem now to present a certain degree of immunity against syphilis, which appears always in a mild form; but it manifests itself with marked recrudescence among the people whom these tribes contaminate. Furthermore, it is admitted that the pox assumes a character of particular gravity when it is transmitted by the mixing of races, especially if it is communicated to people who were originally indemnified.

This affection, among the blacks, localizes itself on the skin, mucous membrane and bones, but as far as my knowledge goes, the nervous system is not affected.

Lesions of the nose and throat happen frequently; the larynx is affected more rarely; and syphilitic manifestations on the ear do not seem to exist.

*Read before the Congrès Français d'Oto-rhino-laryngologie, Paris, May, 1919.

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IX.

THE DIAGNOSIS AND TREATMENT OF LATENT ANTRUM DISEASE.

By H. B. LEMERE, M. D.,

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In the title of my paper I use the term "latent antrum disease." The word "latent" is used by me in this connection to specify antrum infections which are obscure and do not have the outstanding symptoms of either acute or chronic antrum disease. These obscure cases are generally low grade infections, yet some show recurrent acute exacerbations when the condition becomes very evident and is no longer obscure.

In the diagnosis of these conditions I have found transillumination very unsatisfactory. With an antrum full of opaque pus the shadow from the lamp is very decided. With these low grade infections there is often only an infected mucous membrane with very little free pus and no definite shadow is produced. One of the standard signs of antrum disease, viz., shadow or transillumination, is therefore lacking.

In searching for focal infections I have made a routine practice for some time past to examine carefully skiagraphs of the nasal accessory sinuses. The pictures are taken in different directions and each serves as a control on the others. I have a lighting cabinet in my office, and I examine the plates personally, comparing my findings with the diagnosis from the radiologist and with my own clinical observations. After over a year of careful study in this manner I have come to the conclusion that there are many infected antra which I formerly did not recognize. I have no doubt that with the vast improvement in radiology and with its increased employment that many men are also discovering these low grade infections, but unfortunately attention has not been called to the importance of their discovery and treatment nor have they received any definite classification. They are often not recognized, because the two classic diagnostic signs of a dark shadow by

transillumination and of pus under the middle turbinate are often absent.

I have already referred to the unreliability of transillumination. It often fails because the secretion is of a glairy translucent consistency which does not show in transmitted light but which shows a definite shadow with the X-ray. This glairy pus, on account of its translucency, is often hard to distinguish in examination of the nose, either by anterior or posterior rhinoscopy.

In the diagnosis of nasal sinus infections, I have learned to rely very greatly on the condition of that lymphatic tissue in the pharynx lying in a vertical streak immediately posterior to the posterior pillar fauces. When infected secretion is being drained into the pharynx this tissue becomes acutely congested and stands out as a decidedly red swollen band and this always means either acute or chronic nasal infection.

In studying the skiagraphs if only those cavities are considered diseased which show a markedly opaque shadow, there will be many foci of infection passed over. I classify my shadows as clear, questionable, cloudy and opaque. I have at least three plates taken in different positions. In determining the degree of opacity, the antrum shadows are compared not only with each other, but also with the density of the other nasal accessory cavities. Each picture is considered a control on the others, and under these conditions a slight degree of cloudiness shown in every position has an intensified significance, and when combined with the enlargement of the pharyngeal lymphatic pillar it is diagnostic of a low grade infection.

The importance of these low grade antrum cases lies in the general or remote symptoms resulting from them. Many of them have no localized pain or even discomfort from the discharge, and there is little to call attention directly to the antrum. The symptoms are remote and are those which are becoming more and more recognized as due to focal infections. The most important of these which have appeared in my cases have been generalized headache, neurasthenic symptoms, anemia, chorioretinitis, catarrhal otitis media, otosclerosis, cardiovascular and nephritic changes. The subjective

localized symptoms of pain, etc., referable to the antrum itself are often entirely absent.

The treatment is necessarily operative, and only in those cardiovascular cases in which operation must be excluded are we justified in simply removing swollen middle turbinates and polyps and attempts at drainage by nasal washes and sprays.

An antrum once chronically infected cannot be restored to health except by drainage instituted by operation. The operative procedures for antral conditions described in the textbooks and in general use I find generally either too radical or not efficient. The Caldwell-Luc and the still more radical obliterating operations are far too radical and are not intended for the mild grades of antral infection I have described. A strong objection to an extensive operation is the length of time it necessarily consumes even with a skilled operator. Many of these cases of obscure antrum disease are being operated upon because the continuous source of infection has produced a very unstable nervous condition or cardiovascular or nephritic changes so that a short operation with shock at the minimum is imperative. The radical operations do not come under these requirements. On the other hand, it seems to me that the intranasal operation requires a large amount of cocaine and the anesthetic effect on the inner wall is uncertain, so that the patient is frequently in such a nervous condition from the effects of the cocaine and from the pain that the operation is completed with an insufficient opening. It is also generally necessary to amputate the anterior third of the inferior turbinate not only to provide room for operation but to render possible subsequent irrigations which would otherwise be difficult and painful. The sensitiveness of the nose after the intranasal operation and the lack of any external patent opening remaining after the external operation make irrigation of the antrum difficult and painful till the reaction of the operations has subsided. I consider this a decided disadvantage. My procedure is not new and no originality is claimed for it. The purpose is (1): An operation with the minimum amount of shock; (2) A permanent free opening into the nose; (3) Means of carrying out constant irrigation in a manner painless to the patient. The following is a brief description of the means taken to attain these ends:

Ether anesthesia is used, commencing with a mask and continuing with Beck-Mueller ether apparatus with the mouth-piece. A large retractor elevates the upper lip and a horizontal incision one inch long is made in the line of the junction of the mucous membrane of the gums and the cheek and immediately over the anterior wall of the antrum. The periosteum is raised. A Hudson drill is used to enter the antrum from its anterior wall. By using the second sized burr the hole is made half an inch in diameter and is sufficiently large for instrumentation. A medium sized round spoon mastoid curette is introduced through this anterior opening and an opening made low in the nasal wall one-half an inch in front of the posterior limit. Forward cutting forceps are now used to cut the opening forward as far as possible, always hugging the floor. A large spoon is used finally to finish off the opening. A perforated tube is now introduced through the oral opening and tied in place with one suture, which also closes the incision in the mucous membrane. This tube is long enough to extend out of the mouth. The whole procedure takes usually about five minutes, and the postoperative shock and depression is usually not nearly so severe as from a tonsil operation. On account of the obstruction of the field by bleeding, the opening into the nose is made by the anatomic knowledge and the sense of touch. If time is taken to maintain a clear field and to stop hemorrhage, the operation is lengthened beyond the desirable limit.

The operation is a modification of the Caldwell-Luc, but the use of the Hudson drill, thus speedily getting an opening into the anterior wall, the preservation of the inferior turbinate, and of the antral mucosa which is not curetted, and finally and chiefly in providing for constant irrigations after the Carrel method, transforms the operation from a radical procedure to the most conservative operation on the antrum. The mucous membrane of the antrum is conserved, the inferior turbinate is conserved, the strength of the patient is conserved. It is wrongly called an external operation, as nowhere in the skin scarred nor is there any deformity. It is an oral, not an external operation.

The after-treatment consists in washing through the antrum the night of the operation so that the nose may be clear and

sleep possible. After the first day there is a through and through washing with some mild alkalin and antiseptic solution. Dakin's solution is too irritating. This can be done absolutely without pain through the projecting tube and is carried out every half hour while the patient is awake. A soft rubber ear syringe is used for these irrigations. A solution is placed near the patient and his cooperation enlisted. The morning of the fourth day the tube is removed and the hole remains sufficiently patulous for a few days to wash through with the small rubber ear syringe. At the end of a week or ten days this can no longer be done and the small metal tube of a De Vilbiss syringe is used to wash through the oral opening as long as possible. The antrum is now generally clear from pus. A nasal wash is given and the patient is discharged. There may be an acute exacerbation on taking cold, but it is easy to wash through the nasal opening and the infection subsides with practically no inconveniences.

Convalescence is very rapid and the cleansing of this reservoir of infection produces as marked a change for well being as follows the eradication of other chronic foci of infection.

The following is a typical case showing an obscure antrum condition acting as a focus of infection to a condition not generally attributed to removed infections:

Mr. C. C., age 20, presented himself for eye examination April 30, 1919. Right eye, vision 20/20; w. — .50 cyl. ax. 90° 20/10. Fundus normal. Muscular action normal.

Left eye vision, fingers at eight feet. Unimproved. Fundus normal. Third nerve partially paralyzed in all its branches. Slight ptosis, slight mydriasis. Eye diverges about 25 per cent, but has some motility inwards, upwards and downwards. Normal excursion outwards.

This condition has been present since patient was two years old, when without any discoverable cause the eye became paralyzed. This fall an operation for cosmetic effect on the paralytic squint was under consideration when the patient presented himself Sept. 9, 1919, with complete ptosis, marked mydriasis and complete lack of action of the other ocular muscles supplied by the third nerve. He stated he had a cold.

Nasal examination showed right nasal cavity normal; left nasal cavity showed small scab on anterior end of middle tur-

binate. There was a slight swelling of the anterior end of the middle turbinate with two small polypoid excrescences. The middle meatus was free on both sides of the middle turbinate.

Pharynx.—Both tonsils showed chronic infection. The left posttonsillar lymphatic pillar was swollen and very red. The X-ray showed all cavities clear except slight cloudiness of the left antrum, persistent in four different positions of exposure.

The exacerbation of the eye condition seemed to the author dependent on an old latent antrum condition, the original acute infection of which was probably the cause of his original ocular palsy when two years old. The author's operation was performed on the left antrum followed by Carrel's irrigation. A specimen of the nasoastral wall procured by the punch forceps was sent to the University of Nebraska for examination. The report was, in part:

"In the submucosa there was marked connective tissue overgrowth, principally in the fibroblastic stage, with numerous lymphocytes. Diagnosis: Chronic inflammation."

The postoperative history was uneventful, except that the complete paralysis recovered to the condition it was when the patient was first seen and he returned to college one week after the operation.

The connection between the antrum disease and the paralysis seemed to be intimate, and I think we are justified in concluding that the original paralysis in childhood was dependent on an acute infection of the antrum which had remained the seat of a latent infection.

In conclusion:

1. The X-ray has exposed very many diseased antra which formerly were unsuspected. These low grade infections show only a faint but persistent shadow with the X-ray.
2. The author's method of dealing with these is constant irrigation according to the Carrel idea but with less irritating fluid to the nasal mucosa than Dakin's solution.
3. The means for this are provided by his operation, which also provides permanent drainage into the nose without destroying the inferior turbinate or the mucosa of the antrum and with a minimum of pain and shock to the patient.

400 BRANDEIS THEATER BLDG.

X.

MILITARY SERVICE*

OF

CAPTAIN HARRY A. BARNES, M. C., U. S. A.

BOSTON.

I should be glad to give you a detailed report of my observations as an army doctor, were it not for the fact that I was assigned for service in the Surgeon General's office. My work, therefore, was entirely administrative. I do not wish to imply that for that reason it was uninteresting; indeed, I shall be surprised if the report which my Chief, Colonel Mosher, makes concerning the organization of the Otolaryngological Section of the Division of Head Surgery, does not prove the most interesting presented to the Society.

At the same time it makes a report from me unnecessary, and I am sending you simply the date of my service in the army.

Date of entering service, June 26, 1918.

Rank on entering, Captain.

First duty, Surgeon General's office, Washington, D. C.

Promotions, I was recommended for a Majority one week before the armistice, which put a quietus on all promotions. Demobilized, November 26, 1918.

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XI.

MILITARY SERVICE.*

OF

T. PASSMORE BERENS, M. D.,

NEW YORK.

Commissioned Major M. R. C., May 15, 1918.

Reported for duty U. S. A. General Hospital No. 1, Williams Bridge, New York, June 5, 1918; in charge of Section of Otolaryngology.

Discharged therefrom December 6, 1918.

Facilities: An empty ward was used as a clinic. Eventually partitions, washstands and sterilizers were secured; a room was set aside for mastoid dressings; another for local anesthesia operations; another for diagnoses and general treatment; one for a reception room; one for an office, and another for a storage room for dressings (the latter was also used for nurses). The various cases were segregated in their respective wards—there were wards for postoperative mastoids, wards for observation, tonsil wards (mostly postoperative) and a ward for mixed cases.

Equipment: Ample.

When I reported for duty, the patients in the wards were the general run of ear, nose and throat cases that one finds in a hospital for these specialties. Being a "General (Military) Hospital," the Medical Department had charge of acute cases, such as acute tonsillitis, etc. Those requiring surgical treatment were transferred to the Section of Otolaryngology, which was part of the Surgical Department. There were many cases of mild coryza, slight deafness, etc., among the staff, nurses and hospital attendants. These were treated in the clinic.

Influenza: During September and October, at the time of the epidemic of influenza, there were many cases of coryza,

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largely imaginative. Of some 1,300 cases of influenza in the medical wards, twenty developed acute otitis requiring myringotomy. The latter were performed early in the attack. They all made uneventful and rapid recoveries. The accessory sinuses were but seldom and then slightly involved. There was no tonsillar or laryngeal involvement. One case of fully developed mastoiditis (influenza infection) was brought and required immediate operation. He made an uneventful recovery.

Tonsils: Two hundred and sixty-eight cases referred from the Medical Department had bilateral tonsillectomies performed, all under local anesthesia. A few of these cases had slight hemorrhages following operation, and a very few required stitching of the pillars with packing between. No desperate hemorrhage was encountered. This is the more remarkable because many of the operations were performed by men under instruction and without previous experience. Novocain was the local anesthetic. Healing took place in ten days or less.

The tonsils of two hundred consecutive cases were collected in sterile bottles and examined pathologically and bacteriologically.

(a) In one hundred cases of chronic tonsillar infection the following results were obtained by the laboratory:

"Ninety cases showed an indefinite streptococcus; 4 cases showed a streptococcus hemolyticus; 4 cases showed a spirillum characteristic of Vincent's angina; 2 cases showed definite diphtheria bacilli."

(b) In the group of focal infections there were 15 acute rheumatic cases, the tonsils of 8 of which showed indefinite streptococcus; 5 showed streptococcus hemolyticus; 2 staphylococcus and streptococcus; 1, colon bacillus in preponderance; 15 neurocardiac asthenias showed indefinite streptococcus; 18 goiter cases (15 of which showed indefinite streptococcus and 3 hemolyticus); 5 chronic cardiac (valvular) diseases (of which 4 showed indefinite streptococcus and 1 hemolyticus); 25 chronic arthritis (of which 20 showed indefinite streptococcus; 3 hemolyticus; 2 not noted). Microscopically the entire group of tonsils showed chronic involvement, some with small abscesses of various sizes, some with destroyed crypts,

some contained areas of phagocytic invasion. (Report incomplete.)

Results: From what could be learned from the observations of the Medical Department, the only group of cases which showed an immediate benefit were the neurocardiac asthenia cases. Their nervousness disappeared, they gained in weight, and the majority of them were sent to full duty. The chronic goiter cases, valvular heart cases and chronic arthritis showed very little improvement during their stay in the hospital. Two cases of acute rheumatism developed acute pericarditis with effusion after tonsillectomy, and one case developed acute rheumatic fever with swelling in some of his joints within a period of ten days after the tonsils were removed.

Among the cases in the wards on my arrival, there were thirty of unhealed mastoid wounds—cases that had been incompletely operated upon (scratch operations) in different army hospitals around the port of embarkation. In practically all of these X-ray examination showed the presence of the zygomatic cells and of the tip cells. According to the history none had had myringotomy or paracentesis before operation. Eight recovered without operative treatment other than curettage under local anesthesia; the remainder required extensive reoperation. Three developed erysipelas, two on the side that had not been operated upon; one in the stitches of the wound. One had a temporary facial paralysis following a radical reoperation. As was to be expected, the results to hearing in all these cases were not good.

Instruction: Teaching clinics were held for the following: Tonsillectomies under local anesthesia; the various mastoid operations on the living; accessory sinus and mastoid operations using wet specimens; functional examinations of the ears; bronchoscopies, using the dog as the subject. Considerable interest was evidenced by the men who attended these clinics.

XII.

MILITARY SERVICE

OF

BRIGADIER GENERAL H. S. BIRKETT, C. B.,

MONTREAL.

Entered the Military Service of the Dominion of Canada in July, 1887, having been appointed Surgeon-Lieutenant to the Third Victoria Rifles of Canada.

In 1894, promoted to the rank of Surgeon-Major; in 1898 proceeded to the headquarters of the Royal Army Medical Corps, Aldershot, England, and there qualified with first class certificate.

Upon returning to Montreal, organized the first regimental Stretcher Section, each member of which was fully qualified.

In 1900, promoted to the rank of Lieutenant Colonel; organized and commanded No. 3 Bearer Company and No. 4 Field Hospital. In 1904, appointed principal Medical Officer of No. 4 Military District; and in 1907 went on to the Reserve in Medical Officers with the rank of Lieutenant Colonel.

At the outbreak of war in August, 1914, made application to be returned to the active list, and assumed the duties of Acting Assistant Director Medical Services, Military District No. 4, and in September of 1914 began the organization of No. 3 Canadian General Hospital (McGill). This unit was the first of its kind offered for overseas and consisted of a selected staff from the teaching body of the medical faculty of McGill University, with the Nursing Sisters from those hospitals associated with the clinical teaching of the medical faculty. This unit was accepted by the Dominion Government and the British War Office for Overseas Service, and I left in command of it with the rank of full Colonel, proceeding overseas on the 6th of May, 1915, and arrived in France June 12, 1915, and was appointed in 1916 consultant in

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otolaryngology to the Boulogne area. Continued as its commanding officer until the middle of November, 1917, when on account of illness was evacuated to England and invalided home in March of 1918. In September of 1918, upon the expressed wish of the military authorities overseas, was requested to return for duty, having recovered my health, and was promoted to the rank of Brigadier General and appointed Assistant Director General, Medical Service, of the Overseas Military Forces of Canada, and proceeded to take up these duties. Returned to Canada the middle of September, 1919, and demobilized on the 11th of November, 1919.

During this service abroad, I was awarded the Colonial Auxiliary Forces Decoration in the field in 1916, and in January, 1917, was mentioned in dispatches by the Commander-in-Chief of the British Forces in France, Field Marshal Sir Douglas Haig, and was awarded the Companionship of the Most Noble Order of the Bath.

PERSONAL REMINISCENCES OF THE LATE LIEUTENANT-COLONEL
JOHN M'CRAE WITH THE M'GILL HOSPITAL
IN FRANCE, 1915-18.*

Lieut.-Col. John McCrae went to France with the First Canadian Division as Medical Officer of the First Brigade of Artillery in September, 1914, and wrote this beautiful little rondeau after the second battle of Ypres. Early in the organization of the McGill Hospital, Colonel McCrae was appointed Chief of the Medical Division of this unit and joined it in June, 1915, on its taking the field. One morning, early in November, he showed me, as his first critic, this poem, written in pencil on a torn piece of wrapping paper. It was subsequently published in "Punch," December 8, 1915. Whilst connected with this unit he also wrote his second war poem, "The Anxious Dead." There is no one for whom I had a higher regard and a greater affection than Colonel McCrae.

McCrae's fondness for dumb animals was one of his lova-

*At the recent dinner of the American Laryngological, Rhinological and Otological Society, held in Boston, on June 2nd, 1920, the Toastmaster, after reciting the poem, "In Flanders' Fields," asked General Birkett to say a few words about the author. These remarks are by request appended to General Birkett's military report.

ble characteristics. Before proceeding overseas he was presented by a colleague with a magnificent charger named "Bonfire," which accompanied him to France, and with his master went through the second battle of Ypres and the battles of Festubert and Givenchy, being wounded on two different occasions, from which he made a good recovery. Upon Colonel McCrae's taking over his new duties as Chief of the Medical Division of the McGill Hospital, Bonfire accompanied him and at once won the hearts of all. Bonfire, inured to the terrors of the battlefield and to the constant boom of the artillery fire, would stand motionless and unafraid at the level crossings and watch the express train pass within three feet of his nose; but one day, when Colonel McCrae had taken him down to the beach for a ride, this ordinarily patient animal began a series of sudden and vigorous jumps calculated to upset any steady rider. His master, on looking for the cause of his disturbance, after a careful search discovered it—a little sand flea, disporting itself up and down in front of poor Bonfire's slim legs.

At one time an order was issued requiring that all horses attached to hospitals be turned in to the depot, and of course Bonfire came under this category. To Colonel McCrae it seemed indeed hard to have to part with his beloved dumb companion, now in their happy days of comparative peace behind the firing line; and moved by the memory of those glorious days of hazard and endurance, he penned his plea that he might be permitted to keep his horse. Had Bonfire himself uttered the words, no eloquence could have given an appeal of more pathetic tenderness than that voiced by the Colonel in the cause of his gallant steed, with the result that General Headquarters gave Colonel McCrae permission to retain his horse.

With one of the convoys there came to the hospital a wounded soldier, and with him his little dog, also wounded, who was admitted with all the other patients, and a card was filled out for him bearing all the particulars, except his religion. Colonel McCrae was called in consultation, and under his kindly care the little creature thrived, trotting about the wards with two wounded stripes on his collar and never more happy than when with his healer and new master. "Windy" was with

the hospital for many weeks, but when he seemed well on the way to recovery, a poison set in, and Colonel McCrae decided to free his faithful little charge from his suffering. By special permission of the Base Commandant, "Windy" was honorably laid to rest, as any other good soldier, as Colonel McCrae afterwards wrote, and over the spot in the hospital grounds a little cross bears the name of one more dumb creature who found in Colonel McCrae his truest friend.

Another member of Colonel McCrae's little family of dumb friends was "Bonneau," the house dog of the concierge. Every morning, at seven o'clock sharp, there was a patter across the floor of the Colonel's tent, a wet muzzle was thrust into his face, and the gentle lick of a warm, friendly tongue woke the sleeper, and told him that Bonneau had come to pay his morning call. Then for five minutes he would talk to Bonneau as he would to a friend, so solemnly and so kindly, and after their little talk Bonneau would trot away, quite happy for the remainder of the day. The French family to whom Bonneau belonged were offered by some friends as much as fifty dollars for the dog; but they, faithful to their affection for the friend of their family, refused to part with Bonneau, now more dear to them as a link with happy associations.

And so did Colonel McCrae endear himself to all, beloved by men and by the gods; for "being made perfect in a little while he fulfilled long years." He left us in the floodtide of his fame and fortune, a great physician, a gallant soldier, loyal to his King and Country, and a most sincere friend.

XIII.
MILITARY SERVICE*

OF

JOSEPH H. BRYAN, M. D.

Date of entering service, April 3, 1917.

Rank on entering service, Captain.

First duty as chief of the Eye, Ear, Nose and Throat Service, Walter Reed General Hospital, Takoma Park, D. C., June 11, 1918.

Promoted to Major, June 4, 1917; Lieutenant Colonel, February 1, 1919; Officers' Reserve Corps.

Demobilized December 2, 1918.

Reported for duty at the Walter Reed General Hospital, June 11, 1918, and was assigned chief of the Eye, Ear, Nose and Throat Service. At this time the service was in charge of Captain William H. Huntington, with Captain C. Norman Howard and Lieutenant S. A. Alexander as assistants. This service was in a very disorganized condition at this time, owing to the most inadequate facilities for caring for the patients. There was only one treatment table in a room about 25 by 30 feet, and a very small dark room for examining the eye cases, and the operating room was so small that it was with the greatest difficulty the operation could be properly done. At this time we were located in the administration building. Owing to the great influx of patients from the surrounding camps and the inadequate housing facilities, the building operations grew enormously, extending over a very large territory.

About the time of my reporting for duty plans had been drawn for the building of an operating pavilion which was to be divided equally between the Dental and the Eye, Ear, Nose and Throat services. General radical changes had to be made in these plans in order to meet the rapid growth of the service of which was chief. When completed this pavilion served

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our purpose very well. The organization of this department required a great deal of time and some tact on my part in order to bring about the changes most desired.

Owing to the rapid growth and the daily increasing numbers of patients, at my request the Eye was separated from the Ear, Nose and Throat, and made an independent service with Major Haden in charge.

The service now consisted of seven medical officers, five nurses, and four separate wards assigned to the Ear, Nose and Throat. We averaged between eighty and ninety patients in the clinic daily, and the operations numbered occasionally as high as twelve. We carried out some interesting scientific investigations in conjunction with Lieut. Col. Nichols, chief of the laboratory service, viz., tonsils in relation to streptococcus carriers, and the sinuses and the ear in relation to the recent epidemic of influenza. The result of these investigations are now being made public.

My work was both administrative and professional; all of the major operations were done by myself, and we had a large number of interesting operations.

In all, my service in the army was most attractive and inspiring, and I regret I had only such a short time to serve actively.

XIV.

MILITARY SERVICE*

OF

MAJOR R. BISHOP CANFIELD, M. C., U. S. A.

ANN ARBOR.

Received commission, September 6, 1917.

Entered active service, October 20, 1917.

Ordered to Camp Custer, Michigan, to take charge of the Ear, Nose and Throat Service at Base Hospital. Remained at this post until May 5, 1918. During this period the Base Hospital was completed to a capacity of about 1,800 beds. The Ear, Nose and Throat Service occupied a building erected for that purpose in the center of the Base Hospital Grounds, and grew steadily to a service of about 30 to 40 beds, besides the consultation service carried on throughout the hospital. During the early months of this period the work was handicapped by lack of equipment, which was supplemented by members of the staff. Later an adequate equipment was secured. The service differed in no way from the average service in a civil hospital, as the epidemic experienced later did not appear until toward the end of my service. The policy laid down by the Commanding Officer of the Base Hospital was to the effect that, inasmuch as the men in this camp had been passed as fit for service, there was no need of attempting to build up a clinic, nor to take care of the minor conditions for which patients seek care in a civil hospital. This precluded the idea of doing any large amount of routine work, or of studying the question of prophylactic surgery of the nose and throat conditions from the standpoint of preventing the epidemics of measles, mumps, scarlet fever, and streptococcus infections which appeared later. During the latter part of my service these conditions began to make their appearance, and opportunity was given over a brief period for study of their relationship to acute infections of the nose and throat, to fatigue,

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and to exposure. It became clear to us that, without exception, these diseases were preceded by acute infection of the lymphoid tissue of the nose and throat, and that they were but rarely seen in men whose noses and throats presented no surgical conditions. Experiments carried on in the laboratory demonstrated that those men whose tonsils had been removed in civil life were but rarely carriers of the streptococcus, while those who had not been so operated and who became ill with streptococcus infection, invariably showed the same infection in the lymphoid tissue of the throat as in the blood stream. This brought up for discussion the value of a standardized nation-wide examination of the noses and throats of men eligible for military service. It is believed by us that such an examination and treatment by qualified specialists would have a marked effect in controlling such diseases, as proved of greatest importance in the camps in this country and overseas.

Aside from serving as chief of the Ear, Nose and Throat Service, I served as Registrar of the Base Hospital, President of the Special Examining Board until May 5, 1918, at which time I was ordered to its Neurosurgical School at New York City, remaining there until July 15. I was ordered to Rockefeller Institute for work on the Surgical Treatment of Wounds. July 29, 1918, I was ordered to report as Chief of the Surgical Service of Base Hospital 76, then mobilizing for overseas service. We received overseas orders August 31, 1918, and proceeded to Vichy, France. Here we took over 20 hotels in which we conducted a Base Hospital of about 2500 beds. We failed to receive our quota of nurses or our surgical equipment during my service with this hospital. This fact interfered considerably with our efficiency, although borrowed equipment made it possible to carry on a certain amount of surgical work, mostly of minor character. During this period we suffered severely from influenza, from which we lost five of our personnel, December 1, 1919.

On December 1, 1919, I was ordered to report to the Commanding Officer of Base Section 3, as Consultant in Otolaryngology. I sailed for home, December 29, 1918, and upon arriving at New York was ordered to Camp Dix for discharge, January 10, 1919.

XV.

MILITARY SERVICE.*

OF

GEORGE MORRISON COATES, Lieut. Col., M. C., U. S. A.,
PHILADELPHIA.

The writer entered the United States service on September 15th, 1917, as Major in the Medical Corps, U. S. Army, coming from the National Guard of Pennsylvania, and was immediately assigned to the Base Hospital at Camp Sevier, Greenville, S. C., arriving there September 18, 1917. His previous military service consisted in having served as Assistant Surgeon, United States Navy, during the War with Spain, and having been a medical officer of the National Guard of Pennsylvania for fifteen years. In May, 1917, he was on the retired list as Lieut.-Col., but returned to the active list at that time as Major.

On arrival, the hospital itself was found to be only partially constructed and not yet in condition to receive patients. The staff also was incomplete, only about fifteen having assembled so far under the command of Major T. E. Scott, M. C., regular army.

In passing through Washington, Colonel Mosher had outlined the plans of his department for the establishment of a Section of Head Surgery to be independent of the Section of Surgery, although this was later modified so that it became a Section of the Division of General Surgery. We found almost immediately that no adequate quarters had been provided for head surgery, one small room being designated as the Eye, Ear, Nose and Throat room and a small joining room to be used by the dental surgeons. As this was the best that could be obtained at the time, I proceeded to organize my department there, having by the 1st of October two assistants in the Ear, Nose and Throat Department and two in the Eye Department, besides two dentists. One of our initial experiences was convincing to the Commanding Officer and the Camp Surgeon, both regular army men, of the necessity for and value

of specialists in army work. Apparently they had no conception of the type of work that was to be done in the base hospital and expressed the opinion a number of times that specialists were out of place in the army; that army surgeons should be qualified to do any and all kinds of work. Still further difficulty was experienced in getting the head section recognized as a separate entity presided over by a chief of service, but this was accomplished later after considerable effort.

Equipment was very scarce and hard to get and of poor quality when obtained. This difficulty was partially overcome by each member of the staff sending home for his own instruments. Practically no cooperation in this respect could be obtained from the C. O. Within a few hours after opening of the wards, the Section of Head Surgery began to function, being called into consultation for various medical and surgical cases, and for opinions for the Disability Board. Within two weeks it became evident that both the Eye, and the Ear, Nose and Throat Departments, could not work in one room, so the original room was turned over to the Eye Department and a small room in one of the wards fitted up as an Ear, Nose and Throat treatment room. The whole ward likewise was turned over to the head service and within a short time filled to overflowing.

The lack of supplies became more acute all the time as work increased and further expedients became necessary. Piano wire for tonsil snares was obtained from musical stores and Dr. E. W. Carpenter of Greenville kindly helped out the department when it ran short of some of the necessary equipment. Wooden tongue blades and applicators were manufactured wholesale by the patients, some of them becoming very expert. Applicators were also made from pieces of discarded wire and aural specula from rolls of tin. These are mentioned simply to show the dearth of supplies.

The assistants in the department were for the most part men of ability, conscientious and loyal. As the department increased and two wards became necessary a ward surgeon was assigned to each; one oto-laryngologist and one ophthalmologist were assigned to consultation work and spent the best part of the day seeing and treating cases in the wards, always

by request sent through the medical chief. Cooperation between the different services was of a very high order and made one appreciate the great value of this type of group-medicine. In our own work, an expert consultation, medical or surgical, could be obtained at a moment's notice. The laboratory was always available for diagnosis, vaccine preparation, etc. The X-ray Department cordially gave us reports at any time and in any quantity.

Owing to the rather poor equipment in the general operating pavilion all the local anesthesia operations were done in the ear, nose and throat ward dressing room. Ether operations, however, were performed in the general operating room. As the weather became cold, and 1917-18 developed into a very cold winter even in South Carolina, heating facilities in the operating pavilion proved totally inadequate. As most of the mastoid cases were complicated by measles and bronchitis, being potential pneumonia cases, operation was frequently deferred as long as possible and even then was undertaken a number of times with the operating room heated only by a small wood-burning stove which smoked atrociously and scattered wood ashes all over the room when the wind blew down the chimney.

The characteristics of the service here were those usually found in a large civilian hospital. Practically every type of acute trouble was encountered although there were many more ear infections than infections of the sinuses. Early in November, an epidemic of measles occurred which included almost half of the personnel of the division. A great many acute ear complications were seen and treated. Prompt notice was brought to the department of any case suspected of incipient ear trouble and in nearly every case of acute otitis media the ear drum was freely incised at a very early stage. In spite of this, and thorough after treatment, a number of mastoids developed.

The soldiers of the 30th Division, which was served by this base hospital, were mountaineers from western North and South Carolina and eastern Tennessee. Contrary to the usual conception of mountaineers, they were for the most part very poor physical specimens, having had few of the diseases of childhood, having apparently little stamina or resistance, 30

per cent of them being hook-worm hosts and also very much below the average in intelligence and education. These conditions made them rather poor surgical risks, but the results of treatment were on the whole satisfactory.

During my six months' service at Camp Sevier, about seventy cases of mastoiditis were operated upon with two deaths. One of these was a case that came in from the field with meningitis well advanced and a dual cerebral abscess. The second one was a case of lateral sinus thrombosis who died after lingering for about three months. Three other cases of lateral sinus thrombosis were successfully operated upon. Healing in most of these mastoid cases was slow and with considerable deformity owing, I think, to the apparent impossibility at that time of obtaining the proper asepsis either in the operating room or the ward. The blood clot dressing was uniformly a failure and the standard packing of the wound had to be resorted to. The use of dichloramin-T towards the end of my service there, or bismuth paste, materially helped in shortening convalescence in these cases. Hearing was, as a rule good after convalescence. Two mild pneumonias developed possibly as a result of etherization, but both made quick recoveries. Many times during that winter all patients in the wards had to be kept in bed for several days at a time in order to keep them warm as woolen clothing was not issued until the winter was well advanced; and coal stoves did not appear until late in the season. Furthermore, during a period of acute congestion in the worst weather that was experienced it was necessary to place many hundreds of patients on the open porches simply screened off with canvas. This was undoubtedly very detrimental to our acute ear, nose and throat infections.

Many tonsillectomies were done, all under local anesthesia. 1/10 of 1% cocain being used by injection. The method used was that described by Lewis of Philadelphia and consists in incising the tonsil, everting it and snaring it off. It is a quick, comparatively bloodless and painless operation. No secondary hemorrhages were encountered and very little primary bleeding. A certain number of acute sinus cases were seen, but the number was very small and we used conservative treatment. Also of chronic sinus cases there were very few, a few eth-

moidectomies and intranasal antrum operations sufficing to clear them up.

Myringotomies were, of course, very frequent, as many as twenty a day being done at times, mostly in the measles wards. Illumination could only be obtained by using a pocket flashlight, which was unsatisfactory at the best, or direct sunlight when possible. Local anesthesia to the drum (cocain, menthol, carbolic acid) was usually employed with more or less satisfactory results.

Peritonsillar abscesses were very frequent, sometimes four or five being incised in one morning. Following the measles epidemic, mumps appeared and later chicken pox, and there was at all times epidemic meningitis, pneumonia and a few cases of scarlet fever. Two of the latter were operated on for mastoiditis in the isolation wards.

Another activity of the Section of Head Surgery was the examining of candidates for aviation. Naturally the Eye, Ear, Nose and Throat Department had the bulk of this work to do though cordial cooperation was obtained from the rest of the staff. Of the first twenty examined most of the candidates were rejected for eye, ear or throat conditions or for failure in the equilibrium tests. Owing to the curious responses in the latter, a special investigation was made and it was discovered that most of these candidates came from the artillery regiments of the division, that they were ordered to take the examination against their will and were very averse to flying. In consequence they were trying to bluff us out, which accounted for any curious results obtained. Later on a better class appeared and the rejections came down to a normal figure.

Many examinations and reports were made for the "S. C. D. Board," most of them having to do with aural conditions. A great many chronic running ears were discovered which should not have been admitted into the service and these were always recommended for discharge as being unfit for combatant troops.

Quite a large number of malingerers were also discovered. These usually consisted in claims of unilateral deafness, at times the individual having normal hearing but more frequently having impaired hearing which was exaggerated into a total loss. Owing to the low mental average of these men

it was usually a very easy matter to detect this malingering by simple methods such as shouting into the bad ear with the good ear only partially closed when total loss of hearing was claimed; also the usual trick of closing the good ear firmly and getting no response to ordinary questions but immediate response when asked to change position, turn around or get up. For the more astute cases the binaural stethoscope test or the tuning fork always sufficed. Great care was taken not to accuse of malingering anyone innocent and at least two observers examined the case and obtained similar results before a report was made.

During almost all of the six months the prevailing micro-organism was the pneumococcus. This was found in the acute otitis medias, the mastoids, accessory sinuses, the tonsils, and the peritonsillar abscesses. It seemed to be almost universal. Towards the end, the streptococcus hemolyticus was appearing more frequently. During the fall and winter of 1917, we noticed a great many cases of pneumomocccic pharyngitis. These cases were all mild, complaining simply of a scratchy sore throat or hoarseness with occasional aphonia. The pharynx was very much congested and there were shallow ulcerations on the soft palate, pillars and the tonsils and also occasionally on the posterior pharyngeal wall. These ulcerations were covered with a semi-translucent, pearlish gray membrane which could be wiped off usually without much difficulty. They looked in some respects not unlike mucous patches and occasionally there was some difficulty in making a differential diagnosis. These cases all cleared up promptly, the period of disability being only a few days on the average. The aphonias, however, were more persistent, at times lasting for a couple of weeks or more. In these the neurotic element was plainly marked.

Capt. George F. Gracey was my Chief of Clinic and my mainstay, a most capable, energetic officer who later attained his majority most deservedly in the A. E. F. Capt. Eugene Orr was a clever operator and a fine otolaryngologist; Lieut. (later Captain) W. T. Bruner and Lieut. Burnside were Ward Surgeons, as well as Lieut. Weiss for a while. My gratitude is expressed to all of them for loyal service, and to all the members of the Eye Staff as well.

About the last of March, 1918, the writer was transferred to the Base Hospital at Camp Hancock, Augusta, Ga. He had held the title of Chief of the Section of Surgery of the Head at Camp Sevier Base Hospital and was nominally under the direction of the Chief of the Surgical Service, although in most respects the Section of Head Surgery had an independence existence. The same condition of affairs existed at Camp Hancock except that here the Head Section was entirely independent, although classified as a subsection of the general surgical service. Later on, indeed, as chief of this section, I was offered the position of Chief of the entire surgical service and only declined on account of my imminent departure for overseas.

On my arrival at Camp Hancock, I found that the Head Section had been through identically the same difficulties in organizing and equipping as we had at Camp Sevier and that my illustrious predecessor, Major John F. Culp, had used similar methods and expedients with excellent results. While the department was not in first-class shape, he also had suffered from the antagonism of the C. O. and had been unable to secure needed supplies and facilities. The otolaryngologists on the Staff there were excellent, consisting of Captain Edward W. Collins, one of my former assistants at the Pennsylvania Hospital, who was my Chief of Clinic, Lieut. (later Captain) John H. Doyle, of Fall River; Lieut. Eli K. Porch, of Philadelphia, and Lieut. M. Raskin, of Baltimore. All gave me loyal, faithful and effective service. Very shortly after my arrival, the head surgery building was completed and fully equipped under the able direction of Captain Collins and Lieut. Doyle and in every respect the work proceeded smoothly.

During the six months at Camp Sevier when we were doing many mastoid operations, Major Clup had only had one at Camp Hancock. This was probably due to the fact that the troops of the 28th Division were seasoned and in superb physical condition. In consequence there were no epidemics of measles or anything else and very little acute otolaryngologic work. Subsequent to my arrival, during the next three months and for the most part after the departure of the 28th Division a small number of mastoids developed needing operation, about twenty in all being done. Several of these were

double and one was a case of lateral sinus thrombosis. But healing was rapid in every case without exception, in almost all of them a modified blood clot dressing being employed with the same technic that had absolutely failed at Camp Sevier. Curiously enough, also, the prevailing organism here was the streptococcus hemolyticus, while at Camp Sevier it had been the pneumomoccus.

Most of the surgical activities of the Clinic consisted in tonsil operating and corrections of deviated septums. The work was systematized so that four operators could easily work at once, the average time for tonsillectomy, after anesthesia was obtained, being about two minutes and for submucous resection varying from $5\frac{1}{2}$ minutes to one-half hour. At Camp Sevier the anesthesia for tonsillectomies had been 1/10 of 1 per cent cocain for injection, nothing else being obtainable. At Camp Hancock for the most part apothesine 1 per cent solution was used with identical results as far as anesthesia was concerned. No toxic effects were ever noted from either of these drugs.

During a period of perhaps a month in the Spring 1918, every submucous case developed a severe pharyngitis or tonsillitis on the first or second day after operation, due probably to some infection in the ward. This was controlled by masking suspicious ward cases and by spraying the throats of the operated cases with 2 per cent dichloramin-T and when this technic was followed no further infection resulted. All operative work was done under strict antiseptic precautions. The patients before operation took a bath, shaved, put on clean pajamas and brushed their teeth. On arriving in the operating room, they were required to wash their hands and faces with soap, water and either alcohol or bichlorid solution. They were then put in sterile gowns with sterile caps on their heads and sterile sleeves pulled over the arms of the operating chair. If the case was a tonsillectomy, the site of injection was painted with iodine before the needle puncture was made. In a large number of tonsillectomies done, no infections or untoward results were observed. Most of the submucous resections were done on almost inconceivably battered-up noses, every type of deviation being present and all equally bad. Some tears necessarily resulted in these cases, but, owing

to careful asepsis, after treatment and very light packing, no perforations resulted and good results were obtained in nearly all cases.

Dichloramin-T solution was found to be most satisfactory in any type of infection or abscess cavity where it could be applied directly to the suppurating area, small infections of the mastoid wound or partial decomposition of the blood clot in a few instances clearing up immediately after the dichloramin T-chlorcozane solution was employed. It was also used as a routine in the treatment of chronic suppurative ears awaiting the disability board and with results that we felt were better than by any other method of conservative treatment. The method of employment was to fill the external auditory canal full with the solution, a probe being then passed to the bottom to release air bubbles and pressure on the tragus employed to force the solution into all parts of the cavity. The ear was then plugged with cotton and allowed to remain this way for twenty-four hours, all odor disappearing and discharge being very materially diminished, although in the short time that these cases were under observation, none of them became entirely dry.

Another activity of the Head Section was the cure of chronic diphtheria carriers by tonsillectomy. There were probably about eight of these cases operated on, all of whom had shown continuous positive cultures for periods running from four to ten weeks and who had resisted every other means of eradicating the organism. Tonsillectomy was done on all these cases with the result that their cultures immediately became and remained negative. As at Sevier, hearty cooperation was always obtained from the rest of the Staff, and, after the first few weeks, from the C. O. also. Major (later Lieut. Col.) Fred Barrett, of New York, assumed command a few weeks after my arrival and was always most cordial in his support and most helpful in every way.

Late in July I was ordered to Camp Wadsworth, Spartansburg, S. C., to join Base Hospital 56, being organized for overseas service.

Shortly after my arrival I was directed to assume command and undertake the work of organization. Here again the same difficulties were experienced as in the organization

of the departments in the two previously mentioned base hospitals, namely, lack of cooperation, chiefly in the supply departments. The work was pushed vigorously, however, and equipment obtained in one way or another so that the organization entrained for Camp Merritt on August 22nd with 188 men and 36 officers. At the very efficient embarkation camp which we reached in a few days, conditions were entirely reversed and everything was done to facilitate completing our equipment and preparation. The organization passed a splendid inspection two days after arrival and was ordered into the transport on the third day.

Base Hospital 56 sailed from Hoboken on the Transport Kroonland, in a convoy of nine other transports. She carried 3000 troops, 1500 of whom were Southern colored soldiers equipped as pioneer infantry who had been in the service but a few weeks, had no noncommissioned officers and were commanded by three First and three Second Lieutenants. It was my bad fortune to be placed in command of the two compartments containing these soldiers as well as our own organization. They were very bidable men, but knew nothing whatever of army or ship life and it was difficult to keep proper sanitation in these troop compartments where the ventilating fans were constantly breaking down and out of commission and where the plumbing leaked badly.

Influenza developed when about one week out of port, several hundred cases, all told, being reported, but no deaths occurred while at sea. The port of Brest, France, was reached on September 12th, debarkation took place September 13, and three days were spent in the so-called rest camp at Pontanazen Barracks.

Thereafter a three days' railway trip took us to the Hospital Centre at Allery in the Department of Saone et Loire. This Hospital Centre was in process of organization and was already occupied by three Red Cross Base Hospitals, ours being the first Army Base to arrive. It was constructed for ten organizations, although at no time did it ever have more than seven.

Base Hospital 56 took over an area in which work had been started by a sub unit of Base Hospital 49 (Univ. of Nebraska) and there were at the time of our arrival about 400 mild cases

there. Our hospital was at once designated as the Contagious Hospital for the Centre and was also to have charge of all dermatological cases. Surgery was to be held at a minimum. Within a few hours after our arrival, one hundred nurses belonging to our unit appeared, 60 of these being immediately transferred to other organizations. Soon 20 nurses became sick from overwork so that during the most strenuous days of the hospital's existence, we had no more than 20 female nurses on active duty. We arrived with 180 enlisted men, which was 20 below our quota and 60 of these were at once detailed to other organizations. Within a few days another hospital section was put in our charge and staffed largely from our unit although small details of officers and men were added to it from time to time from other hospitals.

Hospital trains from the front kept pouring in with the sick and wounded from the Meuse-Argonne offensive so that our surgical wards were soon filled with serious cases, over 500 dressings being done daily and from 10 to 15 operations. The total capacity of the hospital section was designated to be 1000, but this was increased by orders from the centre C. O. to 1550 in 56 and to 1700 in 56A, giving a total combined capacity of 3250. This was only accomplished by crowding 70 to 75 beds in wards designed for 50 and that should not have had over 40. Every necessity for running a hospital was difficult or impossible to obtain. The roads were deep in mud and transportation was not available. Stoves did not go up until late in the fall, coal was very scarce, as also was food at times and drugs nearly always. Every available corner of the hospital had beds and patients in it, and the general mess had to work almost continuously to keep them fed.

During these trying times of endeavoring to organize in the face of these difficulties, we were further hampered by constant inspections and criticisms, not of vital things, but of unwashed window panes, cigarette butts around the ward back doors, muddy walks, etc. Such criticisms and occasional minor punishments, such as confinement to the area, made it difficult to keep the morale of the staff at its highest point.

In the contagious department, which was speedily reduced to one ward owing to the frequency with which the wounded came in from the front, the problem was how to efficiently

isolate a dozen different kinds of contagious diseases. It was so successfully accomplished, however, that although the ward contained at one time epidemic meningitis, measles, scarlet fever, diphtheria, mumps and erysipelas, only one case of cross infection resulted during the three months the hospital functioned, and this was in a case of measles who had been definitely exposed to diphtheria before he arrived in our care. This result was accomplished by strictly cubicing every bed and masking every patient as well as the attendants, nurses and medical officers and by carefully sterilizing by boiling or burning every article that was carried into a cubicle. In addition each group of cases was divided from the others by moist sheets strung across the ward, and individuals passing from one group into another were required to change gowns each time as well as wash up in cresol solution. This required an enormous amount of work and attention to detail, but owing to the perseverance of Major Pilcher and his able assistants it was successfully accomplished.

An epidemic of diphtheria broke out in the center and was made worse by the difficulty in making a diagnosis between laryngeal diphtheria and membranous laryngitis in the gas cases. The symptoms were practically identical and in a number of instances gas laryngitis was diagnosed as diphtheria from the culture when at postmortem no evidence of membrane was found. In a number of cases also distinct diphtheritic membranes were found at postmortem where they had not been suspected, in gas and pneumonia patients. There were two or three deaths from laryngeal diphtheria in spite of tracheotomy being done, no intubation set being available, and the supply of diphtheria antitoxin having become very low and no more obtainable. Energetic measures were instituted throughout the entire center, with the active cooperation of the laboratory and the epidemic was soon under control.

Barron and Bigelow of the Center Laboratory in reporting on the situation believe that the influence of delayed diagnosis on the spread of diphtheria for the reasons mentioned above was quite large. This was controlled by an examination of the throats of all patients and personnel daily, together with the culture of all showing any suspicious signs. These cases were then isolated, until the result of the culture was known,

in wards that were strictly cubicled and masked. Barron and Bigelow believe that the two probable modes of introduction of the diphtheria bacillus into the center were gassed carriers and chronic carriers. Factors in the spread of the disease were undoubtedly crowding (direct droplet infection), contaminated hands and fomites (indirect droplet infection), and delayed diagnosis was partly explained by the similarity of symptoms between laryngeal diphtheria and membranous laryngitis due to gas. Overcrowding was believed to be the most important. In addition to other methods of control, the Schick test was done, followed by immunization of all susceptible individuals when antitoxin could be procured.

Practically all deaths were autopsied. In the pneumonia cases it was my privilege to see a good many of the post-mortems, and in each case the accessory sinuses and the middle ears were carefully investigated. In a very large proportion of cases, over 80 per cent if I remember correctly, pus was found in one or more accessory sinuses or in the middle ears, or in both. In nothing like this proportion was it found in other than pneumonia cases, which would seem to be significant.

Peritonsillar abscesses were quite frequent, and occasionally acute middle ears were seen, but even during the epidemic of influenza there were very few, and only two mastoids developed in our combined hospitals of over 3,000 beds in three months' time. Vincent's angina, either in the form of trench mouth or patches on the tonsils and pharynx, was quite common and yielded more or less readily to pure phenol, this being the only drug obtainable which would have any effect upon it. Most of our war injuries were in the body and extremities, those of the head being sent to other centers. We had a few perforating wounds, either from shrapnel fragments or machine gun bullets, of the nose, ethmoids and maxillary antra, and one case where fragments of shrapnel were lodged in the mastoid. These came to us as a rule with Carrell-Dakin tubes in position but usually very dirty. The Carrell treatment was continued in most cases, but where progress was not satisfactory a switch was made to dichloramin-T with the result that they cleared up nicely. No sequel other than an occa-

sional aphonia or an epistaxis was noticed during the influenza epidemic.

Base Hospital 49 was designated for the care of head cases, just as ours was the "contagious" organization for the center, although 56 for the most part looked after its own head cases. Equipment in 56 for nose and throat work was very meager, consisting entirely of one canvas field roll, so that again I personally supplied all instruments, which I had brought with me. In Base Hospital 49, however, there was a fair equipment. No. 49 was a Red Cross organization which obtained its equipment by private subscriptions. This was augmented at Allery by drawing on the other Red Cross units for their surplus nose and throat material. Here good work was done with considerable operating on acute mastoids and sinuses.

After being assigned to several posts for short periods of time I became Surgeon in Charge of Otolaryngology at the Bordeaux embarkation camp, where there were two camp hospitals. During my three months' stay there the service was very light. Two daily clinics were run, one in each hospital, by my assistants, Captain Gregg and Captain Pearlman, but the cases were just the usual type of dispensary case.

The greatest asset I found in my work in the army was the very efficient and loyal personnel with whom I had the good fortune to work. This was true of all the departments of the Section of Head Surgery and also applies to the staff of Base Hospital 56, A. E. F. The chief difficulties that we had to contend with were the antagonism of the regular officers towards specialists of all kinds and the difficulty in getting supplies. At the time I left the United States, in August, 1918, that difficulty had been overcome at home, but it was encountered again immediately on landing in France and remained so until the end. It is probable that by this time most of the personnel of the regular army Medical Corps has been educated to a greater or less extent in the value of employing specialists even in the army. But it would seem important for this association to take some action looking towards the continuing of this viewpoint so that if another such emergency occurs the battle of the Section of Head Surgery will not have to be fought entirely over again.

XVI.

MILITARY SERVICE*

OF

MAJOR GERARD HUTCHISON COCKS, M. C., U. S. A.

Dr. Gerard Hutchison Cocks was called to active service in the United States Army on May 10, 1917, and served until January 16, 1919, over 20 months.

His time was spent, for the most part, at No. 1 General Hospital, Williamsbridge, New York, and in France with the Presbyterian Base Hospital Unit, which took over No. 1 General Hospital, British Expeditionary Force.

Dr. Cocks has written two articles on wartime subjects, one entitled, "Gas Poisoning in Warfare; A Study of the Effects of Mustard Gas Upon the Upper Respiratory Tract," and a second paper in conjunction with Captain Harold S. Neuhoef on "Gunshot Wounds of the Mastoid."

Dr. Cocks was commissioned First Lieutenant in the Medical Corps, May, 1917. Captain, July, 1917. Major, September, 1918.

*Symposium on Military Service of the members of the American Laryngological Association.

XVII.

MILITARY SERVICE*

OF

MAJOR GEORGE FETTEROLF, M. C., U. S. A.,

PHILADELPHIA.

Commissioned Major, M. R. C., U. S. A., May 21, 1918.
Chief of Department of Otolaryngology, Camp Sevier, Greenville, S. C., June 9, 1919, to July 27, 1918.

Chief of Department of Otolaryngology, Camp Hancock, Augusta, Ga., July 29, 1918, to February 12, 1919. Received discharge February 12, 1919.

The only notable feature of my service was the opportunity of observing and handling the otolaryngologic phases of the influenza epidemic at Camp Hancock. A report of this was sent to the Surgeon General and was read before the 1919 meeting of this association.

*Symposium on Military Service of the members of the American Laryngological Association.

XVIII.

EXPERIENCES AND OBSERVATIONS IN THE SERVICE*

BY MAJOR STANTON A. FRIEDBERG, M. C., U. S. A.

CHICAGO.

The experience of the writer was entirely confined to Base Hospital activities and was almost equally divided between service in the U. S. and the A. E. F. It was not limited to the practice of otolaryngology for "in addition to his other duties" on various occasions he engaged in medicine, surgery, epidemiology, laboratory and administrative work. On the unscientific side he qualified as a builder of mess huts and taking advantage of a slight acquaintance with plastic surgery and endoscopy, he was enabled to close perforations in lead-pipes, and do a little tube work in steam-fitting. The remaining portion of his time was occupied in a critical review of medicomilitary matters in general and sometimes in particular. Inasmuch as these observations were "not in line of duty" and as time has proved, were not necessary for the proper conduct of the war, they will be omitted from consideration and only those features relating to our specialty will be discussed.

Base Hospital conditions during the winter of 1917 and 1918 were no doubt more or less similar in the various cantonments. A million men may spring to arms over night. In the course of a week, however, the elasticity of the spring is apt to be considered impaired by the development of diseases incident to the grouping of large bodies of individuals. Base Hospitals do not spring into existence overnight under the most favorable circumstances, and the problem is still a little more complex when a camp is located off of the main line in a part of the country that God forgot.

The writer received his commission in the Medical Corps,

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November 6th, 1917, and was assigned to duty at Camp Doniphan, Ft. Sill, Okla., January 8, 1918. The Base Hospital was far from completion in spite of the fact that a division had been in camp since the previous autumn. Owing to the various epidemics the Hospital was greatly overcrowded. Equipment was lacking and patients in need of surgical aid were transported by ambulance to the Post Hospital, some little distance away. After operation, as soon as their condition permitted, they were returned to the base. Sanitary conveniences were inadequate. There was a paucity of nurses and the care of the patients devolved upon the corpsmen, many of whom had had but little training. In spite of all of these handicaps the amount and quality of the work done, was, to say the least, extraordinary. To have had even a small part in this accomplishment is a source of the greatest satisfaction and one of the most pleasant remembrances of the service to the writer.

In the department of Head Surgery, the problem of instrumental equipment was easily solved by sending for our own. Previous to its arrival it was found that a Goodell uterine dilator was a useful aid in resetting a fractured nose. Abdominal retractors properly held will allow ample exposure of the mastoid cortex. An overworked dull gouge is a matter of indifference to an anesthetized patient. By carefully directing the blows of the mallet the danger from concussion may be obviated. As a substitute for snare wire, hairpins proved their efficiency in something over 25 operations. A peculiarly negative result followed all our efforts to obtain wire. All these efforts were made through "channels," as the G. O. against unofficial communications was strictly observed and the distance to be covered was too great to allow of a personal interview.

Two wards were assigned to the department, one of which was partly occupied by the out-patient clinic rooms. With overcrowding about 60 beds could be placed. From 50 to 150 patients from the field visited the clinic daily. The calls for consultations in other wards were numerous and insistent. In one morning the writer examined 44 patients in other departments of the hospital. With the limited help and facilities the outside demands made it difficult to give proper attention

to our own patients. The overcrowding of the out-patient department with men in different stages and varieties of disease was recognized to constitute a serious situation. Not a few patients visited the clinic, as it furnished them the opportunity of relief from drill for the day. Others came with minor ailments that could be cared for equally as well in quarters. By eliminating these classes we were able to establish the hospital work on a more satisfactory basis.

Climatic conditions were very trying as there was a wide variation in temperature and frequent dust storms. As a consequence there were many infections of the upper respiratory tract and middle ear. The policy was adopted of hospitalizing all acute middle ear cases, and it was demonstrated beyond question that this served to the greatest degree to prevent complications. Patients on other services who required special treatment were transferred when possible to our own wards. In this way a rather extensive hospital service was built up and the department had at one time 185 beds at its command.

A large portion of the work in the department was in otology. A considerable number of patients with mastoiditis requiring operation was found. From the middle of January up to May 1st, something over 80 mastoid operations were performed. At one period an average of 60 dressings were being done daily. The prevailing organism in our mastoid cases was the streptococcus hemolyticus. The prevalence of cross infections made it particularly necessary for close observation following operation. Patients would be making satisfactory progress and then suddenly develop temperature. In a day or so the additional diagnosis of scarlet fever, measles, mumps, diphtheria, malaria or erysipelas would be added to his clinical record. We also had the experience with two patients who apparently pursuing a normal course for several weeks after operation and then suddenly developed meningitis. Post mortem examinations failed to show any connection between the ear and the meningeal condition. Several cases of serous labyrinthitis were observed. As a complication in the acute stage of otitis, facial paralysis was found a number of times. The condition cleared up following operation. Cranial complications were rare. One patient developed

severe symptoms after operation and on reoperation the diagnosis of extradural abscesses was confirmed.

Simulation of deafness was not uncommon. Not a few of these cases were in patients who had had a mastoid operation. The usual tests uncovered the deception. Several men with burns of the external auditory canal were seen. The condition was so unusual that it led to the supposition that they were made with deliberate intent.

In the diseases of the nose and throat, the usual variety of cases were seen. The acute accessory sinus infections were relatively fewer than would be expected under the circumstances. The most common throat conditions met with were tonsillitis, peritonsillar abscess, diphtheria and Vincent's angina. One patient with an edema of the larynx was observed. Hysterical aphonia was not at all uncommon. The condition that caused us much concern and consumed quite a good deal of our time, was the carrier problem. A full report of our investigation has been published, and it is therefore unnecessary to go into any further detail. Over three hundred diphtheria carrier patients were operated upon, with, in the main, gratifying results. To show the extent of the infection, in approximately 20 per cent of the patients admitted to the Head Surgery Department, diphtheria bacilli were found to be present. One meningococcus carrier was cleared of the organisms by the removal of his adenoids.

In the early part of August, 1918, the writer was relieved from duty at the Base Hospital and assigned to Base Hospital 85 for overseas service. The organization left Ft. Sill, Sept. 1st, and arrived in France, September 23d. We were assigned to duty in the district of Paris and proceeded to organize the hospital. The class of patients assigned to us were chiefly convalescents from other hospitals. We did not receive battle casualties as we were not in a position to take care of them. Various members of the staff were assigned temporarily to other units and thus were fortunate in obtaining some experience in War Surgery. In the Head Surgery Department, the work consisted largely in the treatment of acute ear, nose and throat infections.

About the middle of December, 1918, the Hospital was discontinued and the unit sent to relieve Base Hospital 27 at

Angers, France. The Hospital at this place had a capacity of over 3000 beds. Postinfluenzal conditions and the acute infections furnished the larger part of the work. Climatic and billeting conditions were responsible for a great number of acute otitis media cases. Immediate hospitalization again brought about the desired results in preventing complications. The greatest number of patients in the department at any one time was about 175. About a dozen mastoid operations were performed. Practically all showed the hemolytic streptococcus. Acute infection of the frontal sinuses was very frequent. Involvement of the antrum was relatively uncommon. Vincent's angina was prevalent and in some instances ran a severe and protracted course. Wassermann tests were made in all cases and invariably negative in the absence of syphilis. Several cases of faucial and laryngeal diphtheria, which owing to delay in diagnosis, had reached a critical stage, were seen. Fortunately they all recovered. One foreign body case came under treatment. The patient gave a history of having had a piece of meat lodge in the esophagus twenty-four hours before. Under local anesthesia esophagoscopy was done and the mass of meat found impacted in a stricture of the esophagus. The foreign body was removed without special difficulty.

There was but very little operative work done as we were restricted to emergencies only. Here, too, during the spring months we had an influx of patients with trivial ailments and complaints. It was curious to see how rapidly symptoms could be transferred from one organ to another in patients who desired admission to the hospital. A veritable epidemic of hemoptysis developed in some of the wards, but singularly enough it was never possible to obtain a specimen of blood from a patient. Two patients with laryngeal tuberculosis were found and returned to the U. S.

A word or two may be permitted in comparing the organization of our special department in the U. S. and in the A. E. F. On this side the officer in charge had a number of assistants assigned to him. This was not the case in the units sent abroad. One officer, irrespective of rank, was assigned to special work. A condition of organization that allows a surgeon to have a number of assistants in one place and then

relegates him to the position of a Ward Surgeon in another, is somewhat unsatisfactory and not conducive to the best results. The writer was relieved from duty with Base Hospital 85, April 12, and ordered to return to the U. S. He was discharged from service, April 29, 1919.

All in all a great deal of satisfaction was derived from his military service and he considers it a fortunate privilege that he had the opportunity to be of some assistance to the country in its time of need.

XIX.

DESCRIPTIVE AND STATISTICAL REPORT, DEPARTMENT OF HEAD SURGERY, BASE HOSPITAL, CAMP DODGE, IOWA.*

BY MAJOR M. A. GOLDSTEIN, M. C., U. S. A.,
ST. LOUIS.

The Section of Surgery of the Head, as developed in Camp Dodge Base Hospital, includes in its comprehensive scope diseases of the eye; diseases of the ear, nose and throat; plastic surgery of the face; oral surgery, as applied to injuries and deformities by gunshot wounds and disease; brain surgery, requiring an investigation of all pyemic processes extending from the eye, the ear, the accessory sinuses; the surgery of the neck of infected areas, such as suppurating glands and cellulitis with original focal points in the tonsil and the ear; bronchoscopy, tracheoscopy and esophagoscopy.

This comprehensive section of surgery at Camp Dodge Base Hospital has been placed under the direction of one Chief of Service and a staff of qualified and experienced special surgeons, nurses with special training, graduate opticians and orderlies trained to such service.

The classification, Head Surgery, is arranged into the following subsections:

- (a) Clinical Service.
- (b) Hospital Service.
- (c) Consultant Service.
- (d) Special Examinations.
- (e) Care of Officers and Nurses.

CLINICAL SERVICE.

The most recent improvements in the Clinical Service in Head Surgery has been the completion and equipment of Ward 41, first floor.

*Symposium on Military Service of the members of the American Laryngological Association.

This clinic has a capacity of active daily treatment of at least 200 ambulatory patients.

There are engaged in this clinic one Chief of Staff with the rank of Major M. C., who is the responsible and executive head of the Section of Head Surgery; one Ophthalmic Assistant Chief of Staff; one Otolaryngologic Assistant Chief of Staff, both with the rank of Captain M. C.; two ophthalmic clinic surgeons; four otolaryngologic clinic surgeons with the rank of Captain M. C.; two graduate opticians; one head operating room nurse, three specially qualified assistant nurses whose services are rendered in both the operating room and clinic service; one Sergeant, First Class, in charge of the paper work and business routine of the clinic; one Corporal, in charge of the enlisted men personnel; one stenographer, in charge of the section's correspondence and official bulletins and orders; one operating room orderly to care for sterilizing plant and surgical equipment; two orderlies detailed to attend surgeons at all operations; one orderly acting as register clerk; one nurse or qualified orderly in the branch dispensary; one orderly for clinic records and notations, and two orderlies for general cleaning and message service.

The Head Surgery Clinic is open from 8 a. m. to 5 p. m., daily (Sunday, from 9 a. m. to 12 m.), for the treatment of patients sent from the regiments and infirmaries, cases referred from other services or from the admitting office, and for the conduct of operations required in the course of such service.

Official reports of the Head Surgery Service to Washington are made monthly, as prescribed by General Orders No. —, through the Department of General Surgery, and include a detailed statement of all patients treated; of all operations performed; their character, result, technic, name of operator and anesthesia; with the time of performance; name, rank and organization of patient, operator, etc.

When first organized the Base Hospital of Camp Dodge occupied as quarters the barracks now used by the 313th Sanitary Train.

The Section of Head Surgery was housed in one room, used the equipment of a fixed hospital and had a few beds scattered at random in the medical and surgical wards. The

work was done by one Captain M. R. C., and ten Lieutenants M. R. C.; no members of the Army Nurse Corps were then on duty, and work was limited to operations and treatments absolutely necessary; no major operations and only a few elective operations (such as tonsillectomies) were attempted.

The new Base Hospital was occupied about October 25, 1917, and the Section of Head Surgery moved into its new quarters at that time. It now occupies a building devoted to head surgery, a good sized lecture room, an eye operating room, reflection and dark rooms; an ear, nose and throat clinic room, and nose and throat operating room and sterilizing and linen rooms, these, with the office of the Chief and Assistant Chief of Service, comprised the quarters occupied. The house was located at first in one, and then two, and lastly three wards.

RECORDS.

A specially arranged card index record is kept of every patient admitted to the clinic service of head surgery. This record contains a brief statement of diagnosis, treatments given, progress, and final disposition of case.

HOSPITAL SERVICE.

The Hospital Service comprised in its maximum capacity three two-story barracks, comprising wards 39-41 and 43, was constituted as follows:

Hospital Barracks No. 39 is composed of four wards, each of a capacity of sixteen beds and three isolation wards; wards A and B used for clean surgery (tonsillectomies, septum resections, plastic surgery, etc.). Wards C and D (total capacity of 32 beds), for postoperative mastoids, acute accessory sinuses and acute ear cases; the isolation rooms (of three beds' capacity) were used for observation and isolation of infections developed during the postoperative care of these cases.

Ward 41, the entire first floor of Hospital Barracks 41, used as the head surgery clinic. Wards A and B on the second floor (capacity, 32 beds), used for eye cases. An unusual feature and adding much to the efficiency of the work in head surgery was the establishment and the equipment of a branch

bacteriologic laboratory department. This branch laboratory is located on the second floor of Hospital Barracks No. 41, especially convenient to the making of all cultures in the clinic and the group of barracks assigned to head surgery.

Ward 43 (capacity, 64 beds and three isolation rooms), given over to acute throat infections (pharyngitis, tonsillitis, Vincent's angina and operative pus cases).

To each hospital barracks is assigned a ward surgeon of the head surgery staff. The supervision of Head Surgery Hospital Service and all the work of the ward surgeons is directly in the care of Assistant Chief of Service.

CONSULTANT SERVICE.

The Consultant Service of the Section of Head Surgery consists of the supervision of all cases in the Base Hospital grouped under the department. An attempt has been made to systematize the work of the service and to economize in time and distance. A regular appointed Staff Surgeon is assigned to do this consultant work, and each ward and barracks of the Base Hospital is visited daily.

In the office of each ward is a peg for head surgery and each ward surgeon and supervising nurse is instructed to leave memoranda on the peg of all patients requiring the attention of the consultant in the ward. This plan insures head surgery attention to every bed patient in the Base Hospital who is unable, because of contagion, isolation or other and more serious ailments, to be assigned directly to the Department of Head Surgery.

SPECIAL EXAMINATIONS.

Special examinations may be classified: Aviation examinations, eye, ear, nose and throat work of the Recruiting Office and demobilization work.

The aviation work was done with full equipment and under the auspices of the Chief and Assistant Chief of the department.

The Recruiting Office Eye, Ear, Nose and Throat Service has been carried out by members of this staff whenever required at the Recruiting Office. The examination of the eyes

and ears of all students for the Nursing Corps are made by this department.

In the work of demobilization a number of the staff surgeons of head surgery have been assigned to an examination and tests of sight and hearing.

CARE OF OFFICERS AND NURSES.

To the Chief and Assistant Chief of this department is assigned the responsibility and the service of caring for officers and nurses in the hospital and in the clinic whenever attention is required for professional work in this field.

XX.

REPORT ON SERVICE IN THE ARMY.*

BY CAPTAIN D. CROSBY GREENE, M. C., U. S. A.,

BOSTON.

I was commissioned as Captain in the Medical Reserve Corps, U. S. A., on April 8, 1918, and received telegraphic orders assigning me to Camp Sevier, S. C., on May 13th following. On May 18th I reported to the Commanding General of the camp and was assigned to duty with the Provisional Casual Battalion. At this time the 30th Division, which had occupied the camp during the winter and spring, having completed its organization and preliminary training, was in the act of moving to the port of embarkation, and the 81st Division, which was to complete its organization there, was already beginning to arrive as the last of the 30th were leaving.

My first active duty was on the examining board which was assembled for the physical examination of the recruits recently drafted, who came in to fill up the personnel of the 81st Division.

I served on this board for three weeks. The unit to which I was assigned examined between three and four hundred men daily, and I made the otolaryngologic part of the examination.

The outstanding features of this work were the small proportion of those unfit for service as compared with the larger number who attempted to evade it by malingerers. It may be assumed that the local boards had already rejected most of the drafted men who were unfit, but many who had been passed by them claimed deafness. It was noticeable that there were waves of malingerers. There would be a group of them in one company, who had evidently discussed the matter among themselves. As a rule, the detection of these cases was simple, but took a good deal of time in the aggregate.

With very few exceptions, the men rejected had chronic otitis media purulenta with perforations and discharge.

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A considerable number of men were referred to the Base Hospital for tonsillectomy and septum resection.

I was impressed by the fact that with better organization and coordination the same grade of examination could have been given in much less time. There was a great waste of time on the administrative end, which could have been avoided by better arrangement of details. At a time when the supreme object of everyone was to build up the army as soon as possible this seemed to me a defect open to serious criticism.

It appeared to me that it would have been better to keep together units of examiners for this special work, for longer periods of time. In spite of the fact that this duty appealed less to the average medical officer than any other work of the department, it was none the less most essential and deserved the most efficient handling. Taking the unit to which I belonged as an example, it was obvious to all of us that at the end of three weeks we were capable of passing upon a much larger number of men in a given time than we were in the beginning, and that without lowering the standard of our examination.

After three weeks on the examining board I was transferred to the Base Hospital for duty in the Otolaryngologic Department and remained there during the rest of my period of service in the army. During the first six weeks it was my great pleasure to have as immediate superior and chief of the department Major George Fetterolf of Philadelphia. I look back on my association with him as the pleasantest and most profitable part of my army experience.

I was assigned to the duty of Ward Surgeon in charge of one of the two wards given up to the Head Section, and had thus the opportunity of learning through actual experience the routine of paper work in a Base Hospital.

On July 28th Major Fetterolf was transferred to Camp Hancock, and I succeeded him in charge of our department, a position which I held until my discharge from the army on December 20, 1918.

The Otolaryngologic Department of the Base Hospital at Camp Sevier began its existence on September 27, 1917, with the arrival of Major G. F. Coates, who remained in charge until March 17, 1918. He guided the department through its

difficult beginnings, and at the time of my advent affairs were running smoothly, and the ear, nose and throat clinic was comfortably established in the Head Section. A building with two wards of forty-six beds each was assigned to its use. The capacity of the hospital at this time was about 1,600 beds.

A brief description of our routine may be of interest. The clinic hours were from 8 a. m. to 12 m., and from 1 p. m. until 4 p. m., on all days excepting Sundays and holidays, when the hours were from 9 a. m. until 12 m. During these periods members of the staff were on duty at the clinic examining, treating and operating.

Outpatients from the camp usually began to come in at an early hour. The chief of the service ordinarily made a visit to his wards at the beginning of the day, seeing with the Ward Surgeon those cases who were confined to their beds. Ambulatory ward patients for the most part came to the clinic room for treatment. Throughout the day calls for consultations on patients in the other services came in, and one of the staff was detailed to respond to those calls. It sometimes happened, as during the measles epidemic of late 1917 and early 1918, and the influenza epidemic of September and October, 1918, that there were patients with ear, nose or throat complications in most of the wards, and one officer spent the better part of the day going through them all, seeing and treating the patients. In this way we were in daily touch with these patients all over the hospital. When there were more than two officers on duty at the clinic it was found useful to detail one, even in normal times, to make the round of all the wards, inquiring of each ward surgeon whether he had any cases which needed attention from our department, attending to such cases, and later making a report to the chief of the department. The following classification may be made of the routine work of the clinic:

1. Examination and treatment of patients.
2. Hearing tests and examinations of officers and nurses newly arrived at this post, of those assigned to overseas units, and of officer candidates for promotion.

3. Tests of candidates for the aviation corps for operations.

Occasionally individuals of our personnel were detailed to duty in the field as members of examining boards.

The variety of cases seen at the clinic was quite large and not unlike that of a civilian clinic of similar size. To one accustomed to the latter there was a noticeable absence of certain classes of cases such as patients with tuberculosis or malignant disease of the upper air tract. On the other hand, certain cases rarely seen in civilian clinics were not uncommon in ours, namely, cases of malingering, hysterical deafness and hysterical aphonia in men. In spite of the effort of the authorities to keep out of the army men with chronic suppurative otitis media with discharge, a large number of these cases appeared in our clinic.

A few cases of pronounced hysterical aphonia and hysterical deafness were seen. Two of the former came under my care and were cured by reeducation and suggestion. They were extremely obstinate cases and were most difficult to handle.

Two cases of hysterical deafness showed complete loss of hearing. Attempts to waken them when asleep by loud noises failed. In one case the patient was put under primary ether anesthesia. The only result of this was the production of a prolonged state of excitement lasting several hours, which required the attendance of several orderlies to restrain the frantic struggles of the patient. The next day he heard no better, but the following night normal hearing returned. This patient had made no response to any tests of hearing. Turning tests were tried but were unsatisfactory on account of the fact that he was in such a state of trembling fright that it was impossible to judge of the nystagmus.

The other patient was cured by our psychiatrist by suggestion. Both of these cases were negroes.

The bulk of our work was concerned with cases of acute inflammatory diseases of the ears and upper respiratory tract. In the operative side of the work tonsillectomy was, as usual, the most frequent operation. In nearly all cases this was done under local anesthesia by infiltration with one-half per cent novocain solution, and the prevailing method of operation was that of preliminary dissection followed by the use of the snare.

In connection with tonsil operating under local anesthesia, I should like to record the occurrence of abscesses of the lateral pharyngeal wall following operation in three cases at our

clinic. In one case this resulted fatally, though not under my personal observation; the only case which I saw made a good recovery after thorough incision and drainage.

The danger of postoperative complications of this nature is one which cannot altogether be avoided when deep injections are made at the periphery of the tonsil and constitutes an objection to this method of anesthesia. There were no immediate deaths from the anesthetic solution at our hospital, but the report of fatal results in a few cases from other camps reached us. These in addition to one personal experience of my own in practice, four years ago, of a death within five minutes of the injection of $1\frac{1}{2}$ drams of a solution of $\frac{3}{4}$ per cent novocain, have impressed the fact that infiltration anesthesia in this region is not without risk.

STATISTICS, OCTOBER 11, 1917, TO DECEMBER 1, 1918.

The total number of cases seen at the clinic was.....	7,498
The total number of patients admitted to our wards.....	1,966
The total number of operations performed.....	1,347
The total number of tonsillectomies.....	523
The total number of resections of the septum.....	93
The total number of intranasal operations on sinuses.....	77
The total number of mastoidectomies.....	83
Other operations included:	
Radical frontal sinus operation.....	1
Resection of jugular vein for sinus thrombosis.....	3
Removal of tumor of upper jaw.....	1

There were two cases of death following operation: one the case of abscess of the pharynx already referred to, and one following radical frontal sinus operation.

GENERAL SURVEY.

During the late fall and early winter of 1917 an epidemic of measles brought in its train a large number of cases of acute purulent otitis media with consequent mastoiditis. The infecting organism was in the large majority of cases the pneumococcus. The conditions created by the epidemic were aggravated by the severe weather of that winter, and the otolaryngologic staff were kept busy, the daily clinic attendance

numbering as high as 150 some days. With the advent of spring the work perceptibly diminished, and during the summer became very light and continued so until the influenza epidemic in September and October. During this epidemic our staff was depleted to help make up for the deficiency in ward surgeons, but there were relatively few cases of serious complications involving the ear, nose and throat.

The outstanding rhinologic complication was epistaxis, which was an early symptom.

Sinusitis was infrequently met with clinically, but was shown at autopsy to be present in over one-half the fatal cases in which the head was opened.

Otitis media was an infrequent complication, occurring in less than 1 per cent of the cases. Rapid recovery was the rule and only five cases came to mastoid operation.

Laryngitis of a severe and persistent type occurred in eighteen cases.

With the subsidence of the epidemic the work dropped off, and up to December 1st the clinic attendance was slight.

The amount of tonsil and septum operating was governed chiefly by the advent of new troops to the camp. With the arrival of each group of recruits there was always an increase in the number of tonsillectomies and submucous resections. During the epidemic of influenza all operating except that of an urgent nature was suspended, and shortly after the subsidence of the epidemic and the signing of the armistice operations were likewise discontinued by orders from the Surgeon General's office.

The department profited at all times by the opportunity for free consultation with other departments. Of special value was the advice of the Chief of the Laboratory Section. His suggestions in regard to the laboratory tests to be employed, especially in patients who were critically ill, were of great assistance and emphasized the importance of calling him in consultation in such cases. The field of a clinical pathologist is one which might be further developed to the advantage of hospitals, in which the tendency to crowd the laboratory with unnecessary tests often occurs at the same time that essential tests are overlooked.

In our own department we found that the plan of having one officer detailed to make a round of all the wards, scouting, so to speak, for cases, was productive of good results. This was, however, possible only when there were enough officers on the staff to provide at least two for duty at the clinic. The plan is suggested as one element in any comprehensive scheme to secure cooperation of all departments, which means effectiveness of the hospital as a whole.

XXI.

MILITARY SERVICE*

OF

SENIOR LIEUTENANT JOSEPH B. GREENE, M. S., U. S. A.,
ASHEVILLE.

I was first ordered to recruiting duty in the Navy on April 25, 1915, with the rank of Junior Lieutenant, and continued on this duty until April 10, 1918. Then I reported at the Norfolk Naval Hospital and was placed in charge of the nose, throat and ear work with two assistants. The hospital at Norfolk was the largest one in the naval service.

On March 28, 1918, I was promoted to the grade of Senior Lieutenant (corresponding to the grade of Captain in the Army). On April 1, 1919, I was ordered to the Transport Finland, and sailed for France on April 10, 1919, returning to America on May 1st. I was then ordered to Norfolk, where I remained until I was discharged from the service on January 23, 1919.

The service at the hospital in Norfolk was large and interesting. The regular naval officers afforded me every facility and co-operated with me heartily in the work.

*Symposium on Military Service of the members of the American Laryngological Association.

XXII.

MILITARY SERVICE*

OF

MAJOR THOMAS H. HALSTEAD, A. R. C.,
SYRACUSE, NEW YORK.

On the organization of the Air Medical Service of the Army, I was made Chief Medical Examiner of the service at Syracuse, N. Y., and continued as such until the service was discontinued. Later served as a member of a local consulting medical draft board until leaving for France in June, 1918.

In June I enlisted in the American Red Cross, arriving in Paris July 11, 1918, where I was made Chief of the Medical Intelligence Bureau of the Medical Research and Intelligence Department of the American Red Cross, of which department Major Alexander Lambert was the head. Headquarters were in Paris. Rank of Major, A. R. C.

This department consisted of four bureaus: Medical Research, Medical War Publications, Library and Medical Intelligence. The department organized and financed the investigation of many medical war problems, notably trench fever, under the leadership and actual work of Col. Strong, M. R. C., and his army associates, published a high class monthly medical journal, known as the *Medical Bulletin* and later as *War Medicine*, devoted entirely to war medicine and surgery, distributing it throughout the whole medical personnel of the A. E. F., as many as 15,000 copies a month. It published and distributed to the same source many timely treatises and pamphlets on surgical subjects of immediate importance. It organized and held in Paris regular monthly medical meetings for the Medical Corps, under the management of the Research Committee, at which meetings the most important members of our army as well as of British and French representatives were present for the discussion of practical problems.

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The department maintained in Paris a first class medical library, both reference and circulating, for the use of the A. E. F. The Medical Intelligence Bureau, of which I was chief, was the fourth branch of the main department. This bureau undertook to investigate and make a research of the literature on any question or subject desired by any member of the Medical Corps, furnishing abstracts or original articles when desired. For this purpose a staff of librarians, translators, abstracters and stenographers was organized, subscriptions made to all the important medical journals of the allied countries, access gained and cooperation secured with the rich medical libraries of Paris, and an immensely valuable index of war medical and surgical subjects was built up and was being made use of to a most gratifying extent when the armistice called a halt to the progress of this, as well as to the other bureaus of the department. Six weeks before the armistice was signed I was made Field Director of the whole department, my new duties taking me in an executive capacity to the Evacuation and Mobile hospitals at the front and to the Camp hospitals in the rear, as well as to the various headquarters of the different activities of the Medical Department of the Army, the Surgeon General's office, the laboratories, sanitary schools, etc. A number of automobile and trips by rail were required in this work and afforded an excellent opportunity to see much of the magnificent work of our militarized profession in France. My headquarters were in Paris, and a part of my duties was to render what surgical service I could to the French in whatever military hospital my service might be welcome. The result was that all my available time, mostly mornings, after the bureau was organized and while I was not away from Paris, was spent in two large surgical departments of Val du Grace Hospital, the largest and oldest purely military hospital in Paris. I was so fortunate as to be accepted as an assistant by our associate honorary fellow, Dr. H. Luc, in the otolaryngologic department of this hospital, and had the great pleasure and profit of assisting our distinguished confrere in many of his operations. His operations on the mastoid, both simple and radical, and which were numerous, were all under local anesthesia, novocain. His patients were all military. Dr. Luc is giving, and throughout

the war, has given arduous and valuable service to his country.

Much more of my time was spent in this hospital in one of the Departments of General Surgery, where I assisted in the service of Dr. Sencert. Dr. Sencert exemplifies the highest type of French surgeon. I have never seen his superior and rarely his equal as a surgeon. He will become famous in medical history because of the original work of himself and Prof. Nageotti, professor of physiology in the University of Paris, on the transplantation of animal sterile dead connective tissue to the living human. It was my great good fortune to see a number of these experimental operations on the dog and to witness several (assisting in one) operations on French soldiers in which dead tendon or nerve, removed from the dog or calf four to six weeks earlier and since preserved in alcohol, was transplanted to the useless, tendonless arm or to the excised sciatic nerve of the wounded soldier (weeks after the injury), the new and foreign transplant restoring function to the useless limb or limbs. In the dog I saw a number of similarly excised and transplanted carotid arteries, the experiment brought to a successful termination as shown weeks later. This work will prove to be epoch making and will open to surgery in all branches undreamt of possibilities.

Though never assisting, it was my good fortune to witness on many occasions the marvelous faciomaxillary plastic surgery of that master of this difficult work, Dr. Morestin, who was at the head of this department in Val du Grace.

Dr. Morestin was a surgical genius, a prodigious worker, a master of technic, a born artist and withal the most skillful operator I have ever seen. He was the head of similar departments in three of the largest military hospitals in Paris, having 365 beds in Val du Grace, and about a thousand in all three. Each patient usually required a series of operations. He personally, with but little though highly skilled assistance, did these operations and watched the after-care. When I saw him he gave the appearance of being utterly careworn, completely tired and exhausted, as he doubtless was, so that I was not surprised to read a few months later of his death at the age of 48.

I returned to America January 1, 1919.

XXIII.

AN ACCOUNT OF THE ORGANIZATION AND DEVELOPMENT OF THE SCHOOL OF OTOLARYNGOLOGY.*

CAMP GREENLEAF, CHICKAMAUGA PARK, GA.

BY LIEUT. COL. THOMAS J. HARRIS, M.R.C., U.S.A., Director,

NEW YORK.

Introduction.—Camp Greenleaf was a part of the comprehensive scheme of postgraduate instruction for medical officers, which owed its conception to the far seeing mind of General Edward L. Munson, M. C. The need of such training to render the medical men competent to do properly the work in the army which was to be required of him, had already, before America entered the conflict, impressed itself upon him.

The full story of how it was put into execution at Fort Reilly by Colonel William Bispham, M. C., at Fort William Harrison by Colonel Ashburn, M. C., and at Camp Greenleaf by Colonel W. H. Page, M. C., and what has been accomplished by them and their successors and the officers will be reported in full at the proper time. It is sufficient at this time to say that it proved to be one of the most important of the many scientific accomplishments, so far as medicine is concerned, brought about by the great war.

Organization.—The School of Otolaryngology, Camp Greenleaf, was organized May 12, 1918, and the first class began its work on the 18th of the same month. On the first of these two dates Lieutenant Colonel, then Major, Thomas J. Harris, M. C., reported under orders from the War Department as instructor in otolaryngology. A considerable number of student officers was waiting instruction and a class of sixteen was detailed for that purpose.

*Symposium on Military Service of the members of the American Laryngological Association.

Building.—A room in Ward Q of the General Hospital was set aside as the lecture room and equipment sufficient to permit of beginning work the following week was gathered together. The school was operated in connection with the Ear, Nose and Throat Department of the U. S. A. General Hospital No. 14, which soon outgrew the quarters assigned to it. This led to the removal of the wards and the school, in July of this year, to McDonald Field, where two buildings and a half of a third building were assigned for its use.

The lower floor of one of these (Ward No. 29) was set aside for clinical and teaching purposes. It contained two treatment rooms, thirty-one by ten feet, with concrete floors, electric lights, etc., a well lighted operating room, twenty-four by twenty-one feet, with concrete floor; a sterilizing room; a private treatment room for officers; a dispensary room; an office for the director; and a lecture room, forty-eight by twenty-four feet in size. All of these were conveniently connected one with the other.

The three wards together contained 128 beds, most of which were constantly occupied.

Equipment.—At the beginning the equipment of the department was exceedingly meager; one nasal speculum and a tongue depressor virtually represented all that the staff had to work with.

A requisition for a complete list of instruments and equipment was early sent in, and in due time everything that was needed in an up-to-date ear, nose and throat clinic, both for treatment and for teaching, was provided. The grateful thanks of the department are due to all the various purchasing officers of the Surgeon General's office. Without such equipment it would have been impossible to do the work that was accomplished.

The operating room was fitted up with two operating tables and a "Holmes operating chair," an Ohio Chemical and Mfg. Co. "gas and oxygen" outfit, an instrument cabinet, dressing cases, etc.

The sterilizing room was provided with an electric American Sterilizing Co. apparatus, capable of sterilizing all dressings and instruments for the department. Each treatment room contained four places for examination and treatment of

patients, with a wash bowl at each place serving as a cuspidor, and electric connections for lights. At the end of each room there was a place for the assistant in charge of the clinic to work. Each room was provided with a modern "Wappler" suction apparatus. The private treatment room was also well equipped and contained a "Wappler" suction outfit. The lecture room was provided with blackboards and a "Barany turning chair."

The school was particularly fortunate in possessing an unusually valuable collection of out sections of the head, loaned by Lieut. Col. Harris P. Mosher, M. C., and Lieut. Col. William H. Haskin, M. C. In addition to these there was a good supply of wet specimens of the head, a gift of Lieut. Col. C. W. Richardson, M. C.; a fine collection of lantern slides of the accessory sinuses, a gift of Major H. W. Loeb, M. C., of St. Louis, and a collection of excellent slides of the ear, a gift of Dr. B. Alexander Randall of Philadelphia. Without these collections, satisfactory teaching would have been impossible.

Clinical Material.—The clinical material was at all times abundant. At no time were there less than 1,200 patients, and often as many as 2,000 or 2,500, in the hospital. In addition to this, the various camps scattered throughout the park contained as many as 60,000 troops at times and served as feeders.

The Student Officers.—Altogether, 110 student officers have passed through the school. These were selected after careful examination by the director or his representative, and represented only a portion of those who desired to take the course. On account of the limited time it was impossible to admit beginners, only those showing real fitness being received, and these were not allowed to continue the course in case they proved, after a short time, to be incompetent.

Outline of the Courses.—The course was planned to run from four to six weeks, but from the fact that the War Department did not order the men away at the end of that time it extended in many cases to eight and ten weeks. It was the endeavor to make the course as thorough as it could be made in the time allotted for it. It consisted of lectures and practical work, observation of operations, ward walks, and the

performance of operation by the pupil himself as he showed his ability.

The lectures were given by the director of the department, by his assistants and by the heads of the other departments, including that of the School of Laboratories, School of X-ray, School of Ophthalmology, etc. Much attention was given to anatomy, which was taught with wet and dry specimens, lantern slides and upon the cadaver. For practical work, the class was divided into small groups in charge of assistant instructors. Each student officer was provided with a head mirror and examining instruments and required to make examinations and diagnoses himself. Each week the subjects treated during the week were gone over in quiz by the director of the school. At the end of the course a written examination was given, as well as a practical examination. Based on these two examinations the officer was rated. A report of the ratings was sent each month to the Surgeon General. Officers who had graduated satisfactorily from the school were assigned as assistants in the wards of the hospital. Those of the number who showed themselves especially qualified were given temporary assignment as ward surgeons to the hospital, remaining in this capacity until they were ordered elsewhere by the War Department.

The Staff.—The corps of instructors consisted, in addition to the director, of Capt. William J. Bailey, M. C., Capt. William E. Sauer, M. C., Capt. Francis W. White, M. C., Lieut. Frederick T. Hill, M. C., and Lieut. John F. Curtin, M. C. From the outset it was the aim of the school to cooperate in every way with the other special schools. To that end interchange of lectures constantly took place, and the assistance of Lieut. Col. George De Schweinitz, M. C., and Major Meyer Wiener, M. C., of the School of Ophthalmology; Lieut. Col. Edward Martin, M. C., and Captain W. Lee, M. C., of the School of Surgery; Lieut. Col. W. F. Manges, M. C., of the School of Roentgenology; Major Robert A. Keilty, M. C., of the School of Laboratories, in this respect, has been greatly appreciated. Without their help the comprehensive scope that the work assumed would have been impossible. In the same way the director of the school lectured at regular intervals to the School of Surgery, and practical instruction was

given to the class, in the methods of examination of the nose, throat and ear.

Conclusion.—As stated in the beginning of this article, the School of Otolaryngology was only a part of the comprehensive plan for postgraduate instruction for medical officers. Scarcely had this country entered upon the war, before the pressing need of such instruction became evident to those in charge of the several training camps for medical officers. All those who had to do with these camps, in any capacity, were agreed that an unwarrantedly high rating had been placed on medical education in this country. So far as otolaryngology was concerned, this was driven home with increasingly painful consciousness the longer the war continued.

At Camp Greenleaf a board of examiners representing the various branches of medicine and surgery met daily to examine every student officer immediately upon his arrival. By this plan, everyone representing himself as interested especially in some one of the specialties was assigned for examination to the director of the particular school. In this way opportunity was given to ascertain the qualifications of several hundred men, drawn from all parts of the country, who claimed to be otolaryngologists, or as having had more or less training in that specialty. The results of these examinations were as astonishing as they were disappointing. Whether in the practice of the specialty for a few years or many years, they all, with few exceptions, showed a woeful lack of knowledge of the fundamentals of the specialty. With increasing emphasis as the weeks went by, the need of adequate and thorough graduate education truly to fit men for such work forced itself upon those to whom the duty of making such examinations was assigned. Inquiry shows that out of the entire number who presented themselves very few had had little more than a six weeks' course of instruction. The all important subject of anatomy was a closed book to them. Such a thing as the physiology of the nose, throat and ear few had any realization of. As for pathology, bacteriology and neurosurgery, these did not enter within their field of knowledge. For most of them, the broad field of otolaryngology, with its many intricate side paths, meant only the ability to remove tonsils and straighten septa.

This alarming lack of qualification on the part of the average otolaryngologist practicing in the cities and towns of this country, as demonstrated by the results of these examinations, serves but to drive home with greater emphasis the need of comprehensive and adequate graduate instruction in otolaryngology. So long as the six weeks' course is given to any and all who are prepared to pay the prescribed tuition, apart from whether proper qualifications are possessed or not, so long will our country continue to be at the mercy of ill trained and uneducated specialists.

The work that the American Medical Association has done in the direction of eliminating third rate medical colleges is the greatest step that has been made in the direction of raising the standard of medical education in America. Something like this is demanded to put special medicine on a proper basis. The best plan to bring this about is yet to be definitely agreed upon. For several years a special committee representing the several national societies of otolaryngology has been working upon the subject, and at the outbreak of the war had reached the conclusion that only by the standardization of postgraduate instruction, the agreement between the leading class A colleges of the country to accept the standard, and then, after satisfactory examinations, to confer a special degree, could the incompetent and untrained self styled specialist be done away with.

The work that has been done in the School of Otolaryngology, Camp Greenleaf, is a step in the right direction. In the event of universal military training, in the light of the experience gained at Camp Greenleaf, the pressing need for the continuation of the various professional schools has been conclusively demonstrated.

XXIV.
MILITARY SERVICE.*
OF
HILL HASTINGS, M. D.,
LOS ANGELES.

At the 1917 meeting of the American Laryngological Association, at the request of Colonel Lister, I volunteered to organize a unit for medical examination at Los Angeles of aviation candidates. This unit was formed in September, 1917, and candidates were examined from all the Southwestern States until the end of the war.

I was particularly interested in the ear examinations made in accordance with the army regulations in which the functional examination of the internal ear was carefully kept. After examining a thousand cases, a report was made by means of a contribution to the Western Section of the American Laryngological, Rhinological and Otological Society (February, 1918). This paper was afterwards published in the *ANNALS OF OTOTOLOGY, RHINOLOGY AND LARYNGOLOGY* (June, 1918). Briefly, the otologic findings showed that the vestibular response in the normal individual as regards nystagmus is as standard a reflex as the knee jerk reflex. Also, with proper care in its performance, the past pointing and falling test developed by turning and checked up by douching is equally as consistent. No candidates, even those who had flown considerably, failed to show a well recognized after-rotation nystagmus. It was concluded that a routine internal ear examination should be made by otologists in all suspicious nerve deafness cases, and that the army procedure had proved to be a good standard to go by. Certain remarks were made regarding precautions that the examiner should consider in order to make the standard tests.

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I received my commission as Captain October 29, 1918; was stationed at Camp Kearny and later at March Field Aviation Camp, Riverside, California. I received my discharge January 11, 1919.

XXV.

REPORT OF THE EAR, NOSE AND THROAT DEPARTMENT, BASE HOSPITAL, CAMP SHERMAN, OHIO.*

BY MAJOR C. R. HOLMES, M. C.,
CINCINNATI.

Major Christian R. Holmes, M. C., was assigned as Chief of this department on August 15, 1917. He visited the camp on August 20, 1917, but as the Base Hospital still existed only on paper, he was not assigned to duty until September 1, 1917, when he reported to Lieut. Col. Wallace DeWitt, Division Surgeon, and Captain (now Lieut. Col.) K. W. Kinard, Commanding Officer of the Base Hospital.

At that date the site of the Base Hospital was only a corn field, with the exception of the pilings for the foundation of two or three ward buildings. Capt. Kinard and Major Holmes were quartered in Barracks B-33. As there were no patients in the Ear, Nose and Throat Department, Major Holmes placed himself at the disposal of the Commanding Officer and rendered such assistance as he could in the supervision of the construction of the hospital buildings.

The first patient operated was Pvt. Joe Armas, Co. M, 331st. Inf., September 26, 1917, for acute mastoiditis, by Major Holmes, assisted by First Lieutenant (now Captain) L. R. Effler and Capt. Kinard. The first patients were placed in ward 9, together with other cases.

There being no equipment for the Head Section, excepting a few poorly selected instruments, it became necessary, in order to carry on the work, for Major Holmes to bring his own instruments from Cincinnati.

The original space set aside for the Eye and the Ear, Nose and Throat Department was a small room, 10 feet by 20 feet, located in what is now the Pathologic Laboratory. It was evident from the first that these accommodations would

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be entirely inadequate. About September 15, 1917, plans arrived from Washington for the splendidly laid out Head House. On the block plan, this building was to have been located to the north of the officers' ward, but as the county pike and a cornfield not belonging to the hospital occupied this intended site, it was necessary to change the location. Various sites were studied, but as this building was intended for ambulatory cases, not alone of patients from various wards in the hospital but also for dispensary patients from the cantonment, it was finally decided to locate the building on the east side of the square in the center of the group. The accessibility of this centrally located building has since proven the wisdom of this location.

While the arrangement of the rooms in the Head House was admirably planned, there were many omissions which were necessary to make an efficient working place, as nearly all of the patients were "pus cases." These minor defects, however, were all remedied, as well as the necessary ventilation in the ceilings of the smaller rooms. The operating room originally planned had an ordinary plain wooden floor. This was changed to a composition floor, such as as used for standard operating rooms.

On November 6, 1917, Major General E. F. Glenn called a meeting of the hospital staff and asked if we were provided with the necessary equipment. The reply being in the negative, he ordered the heads of several departments to proceed to purchase what was necessary in order that the sick should not be neglected. On the following day Major James A. Harvey, Major C. R. Holmes, Lieut. (now Major) Henry Stabery, Capt. Henry L. Stick and Capt. D. P. Ray went to Cincinnati and made purchases for the several departments amounting to about \$10,000. These were delivered on November 10, 1917, by trucks, as the railroad shipping facilities were entirely inadequate and would have entailed great delay.

The Ear, Nose and Throat Department has been enabled to render efficient service because of the splendid facilities and equipment placed at its disposal in the Head House and the special wards. The professional qualifications of most of the men assigned here have been far above the average, thereby rendering the unit an efficient factor.

All new cases admitted to the hospital have first been thoroughly examined by either the Chief or the Assistant Chief. All cases requiring operation have received the final examination, and the most difficult ones have been operated by the Chief, but every man on the service was given an opportunity to act as assistant. Those who proved themselves qualified were given major operations to perform, with the Chief as assistant, the latter watching and, at times, relieving the operator if it appeared best to do so in the interest of the soldier's welfare. Every otolaryngologist sent here was first tried out in the Out-Patient Department, where his professional ability was studied and rated. By special demonstration of patients, blackboards and other drawings and lantern slide exhibitions what might be termed a postgraduate course has been given throughout the year. Daily at 1 p. m., all surgeons in this department met in the Chief's office, each man reporting on cases under his care, with general discussion by those present, and criticisms and suggestions by the Chief.

Outpatient Dispensary.—In order to systematize the work in the Head House, the following schedule has been in force: 8 a. m. to 12 noon. (a) Operations begin at 8 a. m., general anesthetics coming first, then those requiring only local anesthesia. (b) All ambulatory patients from the hospital wards report for treatment. 1 p. m. to 3 p. m. (a) Outpatients from the line. (b) From 2 p. m. to 3 p. m., officers and their families come for consultation and treatment. 3 p. m. to 5 p. m. Cleaning up of unattended cases.

Extramural Service.—One man was constantly assigned to this service. (During the epidemic, two or more men were assigned.) He was provided with a complete treatment "kit" in a specially designed metal case, and visited every nonotologic ward in the hospital, beginning at 8 a. m., and reporting to the Chief the daily findings of each case. All cases not running a normal course were seen in consultation by the Chief or his Assistant. This service was invaluable in detecting cases early and operating before serious complications develop.

Study of Diseased Tonsils.—In conjunction with the Medical Service and the Bacteriologic Laboratory, this department began an intensive study of cases with infected tonsils. Two

thousand five hundred examinations have been made, and so far the tonsils of 400 operative cases have been intensely studied.

Diphtheria Carriers.—Together with the Laboratory and the Medical Service, this department has treated and operated diphtheria carriers (removal of tonsils and adenoids). These tonsils were all subject to bacteriologic examinations, and several persistent cases were promptly cured by the operation. One unusual case, having been under observation in the hospital for six months, persisted, in spite of the removal of adenoids and tonsils, until a radical Killian operation for chronic purulent sinusitis was performed.

The acute infectious diseases naturally furnished most of the cases involving the middle ear and nasal sinuses.

(a) **Influenza.**—While many cases of acute otitis media with mastoiditis came to operation during the first eight months of 1918, we had not a single case of sinus thrombosis, but during the influenza epidemic we had four in ten days, all with hemolytic streptococci in the blood. While last winter the mastoid cases were practically all of the nonhemolytic type, nearly all recent cases have shown positive hemolytic streptococci, with great virulence, requiring early operation—even as early as the fifth day, with pus filling all mastoid cells, with perisinus and extradural abscesses.

(b) **Measles.**—During the months of February and March, 1918, 725 measles cases were examined by this department upon their admission to the hospital, and 35 cases of acute purulent otitis media, or about 8 per cent, were discovered. There were also found two cases of edema of the larynx requiring tracheotomy.

(c) **Scarlet Fever.**—During February and March, 1918, 245 cases of scarlet fever were examined by this department upon their admission to the hospital, and 30 cases, or about 12 per cent, showed acute purulent otitis media. However, it must be borne in mind that many more cases of purulent otitis media developed at a later date, both in the scarlet fever and the measles cases.

(d) **Mumps.**—During March, 1918, 450 cases of mumps were examined upon their admission to the hospital, by this department, for ear complications. Seven cases of acute

purulent otitis media were found, but not a single case of total deafness in either ear was encountered, as is sometimes the case in children.

Operations and Treatments.—The first operation performed in the present Head House was made on November 22, 1917, and since then 2,712 operations have been performed in the Ear, Nose and Throat Department, and 47,923 treatments have been given. The total number of cases admitted to wards on this service was 3,694, and the total number of patients treated in the clinic was 6,496 (figures to April 1, 1919).

Streptococcus Epidemic.—During March, 1918, the hospital became greatly overcrowded with patients suffering from contagious diseases, compelling this service to place as many as 52 beds in wards intended for 32. During this period the virulence of the streptococcus infection became very marked, no doubt, in part due to the overcrowding. To offset the ill effect of this, all windows in the wards on this service were kept open 12 inches from the top, day and night, in spite of the cold weather, extra clothing and bedding being provided for the patients. During March there were three deaths from meningitis and one from abscess of the brain in our service. We regret greatly that an order was issued at that time forbidding all postmortem examinations.

Examination of Aviators.—During the first three months of 1918, and previous to that time, many candidates for air service were examined in the Head House, under the direction of the Chief of Head Surgery. After April 1, 1918, examinations for aviation candidates were stopped at Camp Sherman.

From time to time this department prepared for publication papers on different subjects. So far but one paper has been published. The paper is entitled "A Presentation of Fifty Mastoid Cases Before the Base Hospital Officers' Club, April 4, 1918." The paper will appear in the forthcoming issue of the *ANNALS OF OTOTOLOGY*.

The following papers have been prepared and will be ready for publication at an early date:

"A Presentation of 128 Mastoid Cases, with Detailed History of Each Case and Statistical Report."

"A Study of (about) 1,300 Tonsil Cases, with Statistical Report."

"A History of the Epidemic of Influenza, from the Standpoint of Otolaryngology."

"A Paper on Sinus Thrombosis."

In addition to the above, interesting individual cases will be written up. Illustrations have been made for these articles, and the papers will be ready for publication soon.

XXVI.

MILITARY SERVICE*

OF

LIEUT. COL. J. M. INGERSOLL, M. C., U. S. A.,

CLEVELAND.

First Lieutenant, Medical Reserve Corps, June 5, 1915. Captain, April 2, 1917. Major, May 24, 1918. Lieut. Col., April 24, 1919. Began active duty July 25, 1917. Organized the Physical Examining Unit for Aviation Section, Signal Corps, at Western Reserve University, July 25, 1917.

Transferred to the U. S. A. General Hospital, No. 11 (the Hospital for Head Surgery), Chief of the Otolaryngologic Department, May 6, 1918.

Transferred to the Surgeon General's office, Washington, D. C., March 4, 1919. Released from active duty and returned to the Medical Reserve Corps, March 17, 1919.

The paper which I read this morning before the association gives a rather brief account of some of the work in the Otolaryngologic Department at the Hospital for Head Surgery. I should simply like to say, in addition to this account of our activities at No. 11, that the whole work was one of the happiest periods in my life.

Our commanding officer, Colonel Paul F. Sraub, was an unusually high type of man, and my associations with him, and with all of the other men on the staff, were most cordial and pleasant.

The work of the teachers, in the Section of Defects of Hearing and Speech, deserves special mention. All of them made sacrifices to enter the service, and their skill and loyal work and the results which they obtained contributed much to the success of the work.

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XXVII.

OTOLARYNGOLOGY AT CAMP LEWIS.*

BY MAJOR ROBERT LEVY, M. C., U. S. A.,

DENVER.

During the first few months at the United States Army Base Hospital at Camp Lewis I served in a subordinate capacity. This gave me an excellent opportunity of observing military practice and contrasting it with that of civil life. The former has much to recommend it, and many of the trying and often trivial annoyances of civil practice are not met with, much to one's relief.

The keynote of military service is accuracy. Doubtless many others were struck with the vast problem the medical department had to contend with in an attempt to systematize with accuracy and uniformity the service of a large number of medical men, some of whom were insufficiently trained. This was especially apparent in the difficulty encountered in recording case histories. It is my firm conviction that in this as well as in all other branches of the medical corps, our final reports and ultimate conclusions are of much less value because of insufficient and inaccurate recording of clinical observations.

Operations.—In order better to control and systematize the question of operations it was found advantageous to adopt the following form, known as "Request for permission to operate." This was made out by the officer recommending the operation:

Date.....19.....

Register No.....

Name and Rank.....

Request permission to operate for.....

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(Diagnosis)

Indication for operation.....

Quarantine, Ward or Company.....

Evidence of acute inflammation.....

Laboratory Report:

Urine..... (Signed)

Throat Culture:

Admitted to Hospital.....

The laboratory report was initialed by the Ward Surgeon. The "received" stamp was dated and initialed by the chief before the request was sent to the ward; an "approved" stamp was dated and initialed by the chief after all requirements had been complied with, and an "operated" stamp was dated and initialed by the officer operating.

Owing to exposure to contagious diseases incident to recruiting and camp conditions, it frequently happened that soldiers operated for minor ailments were stricken with one of these affections shortly after operation. Care as to quarantine and thorough examination for acute inflammatory manifestations did not always prevent a case of scarlet fever, for example, from occurring in an operated patient to the obvious detriment of the patient as well as to the previously clean ward. In order to avoid this no case was operated upon until after three days of observation in the hospital.

The importance of preliminary urinary examination in all cases, even in those of minor character and requiring only local anesthetic, was illustrated in a serious result following a simple operation, in which it was subsequently determined that the patient was a diabetic.

Variety of Cases Seen.—It is worthy of note that an unusually large variety of diseases of the ear, nose and throat reported at the clinic and hospital for treatment. There was

not the dull monotony one had reason to expect in such a service. Rare affections were occasionally seen, of especial interest was an unusual case of angioma of the uvula, of very large size and extending to the soft palate. A radical operation by Captain C. W. Pierce of my service resulted in complete cure. Othaematomata were commonly seen and an opportunity to try out various methods of treatment was given us. A unique treatment which was here adopted following the suggestions of a Seattle man was the following: The othaematoma was incised and a firm metal or hard rubber tube was inserted; the entire ear was then enveloped in a box of plaster of Paris, the tube remaining exposed. Suction was applied to the tube daily and at the end of two or three weeks the dressing was removed, with most gratifying results.

Tonsillectomy and Adenoidectomy.—As elsewhere, diseases of the tonsils constituted an extremely large portion of our service. The question of tonsillectomy and its complications and the question of the tonsils as foci of infection came in for the usual extensive consideration. The method of operation carried out at Camp Lewis was by dissection and snare; local anesthesia was the rule. Slight differences in technic, both as to operation and anesthesia, were in accordance with each officer's practice. In no instance was local anesthesia followed by serious effects. Post-operative complications were infrequent. In a series of 540 tonsillectomies and 146 adenoidectomies only 31 post-operative complications were reported with sufficient accuracy to warrant consideration. Of these, 23 were post-operative hemorrhage and nine presented some infection; one case having both.

Hemorrhage as a rule was "delayed primary," true secondary hemorrhage being rarely seen. One serious case of secondary hemorrhage occurred following adenoidectomy; bleeding was very profuse, and was only controlled by a post-nasal plug after all other methods had failed.

Infection was manifested by rise of temperature, stiffness of neck, and abscess. There were no fatalities.

Focal Infection.—An attempt was made to arrive at some definite conclusion relative to tonsils and accessory sinuses as foci of infection, particularly as regards arthritis. It must be confessed that the unsatisfactory character of many of the

records was a decided handicap to this study. However a sufficient number of conclusive cases was recorded to make the study worth while. In a series of 200 case of arthritis 50% were believed to have some relation to the tonsils as a focus of infection. A conservative view of this question was always maintained.

An average example is the following:

Diagnosis.—Articular rheumatism. History: Recurrence for past thirteen or fourteen years; in hospital 51 days. After 38 days of general treatment, during which time the patient was on crutches, tonsillectomy was performed. Thirteen days after operation crutches were discarded and patient was sufficiently improved to be discharged.

A review of all cases justified the following conclusions:

1. Tonsillectomy may effect improvement or cure in arthritis.
2. The number of cases cured was few compared to the total number of cases of arthritis treated.
3. The most satisfactory cases were the acute or recent cases, which generally gave a history of sore throat, although this was not invariable.

Meningitis Carriers.—An interesting study of carriers of meningococci was carried out to determine the pathology, if any, that might be found in the nose and nasopharynx. It was an interesting observation that in no case was the meningococcus recovered from the nose or tonsils, but in all instances the habitat of these microorganisms was solely the nasopharynx. The highest average number of days in the hospital occurred in those cases showing adenoids, these being small or of moderate size, although it was worthy of note that 38 per cent of the cases studied presented no lesion in the nasopharynx. These remained in the hospital an average of 45 days as compared with an average of 61 days for those showing some pathology.

Vincent's Angina.—A diagnosis of this disease was frequently based upon laboratory reports, and even though no clinical signs were presented, these cases were isolated. It is believed that this practice was in a large measure unwarranted, for it is a well-known fact that the fusiform bacilli and spirilli may both be recovered in the throat and around the gums of

clinically normal mouths. Sore throats, even of slight degree, showing the presence of these organisms should, however, be considered potentialities for the spread of this infection. No serious cases of Vincent's Angina were observed although many were detained in hospital two weeks or more until negative smears were obtained.

Mastoiditis.—During the early part of the year an epidemic of scarlet fever and measles being prevalent, a large number of ear complications occurred. Of these, although a greater part occurred in the progress of measles, fewer developed mastoiditis than did the scarlet fever cases. The most notable feature of these cases was the rapid and extensive destruction of bone. Dura and lateral sinus were often exposed and perisinus abscesses evacuated. Convalescence was prolonged, secondary suturing being necessary in several instances.

In infectious diseases much can be done to prevent ear complications, and to modify them should they occur. The following prophylactic measures were instituted:

1. Daily survey of all cases of measles and scarlet fever.
2. Careful cleansing of nose and nasopharynx. The establishment of good drainage by reducing the swelling of the nasal mucosa by the use of cocain, adrenalin and argyrol.
3. The patient was instructed as to the proper method of blowing his nose.
4. Prompt myringotomy.
5. Early mastoidectomy.

Influenza and Bronchopneumonia.—The following ear, nose and throat affections were noted:

- Otitis media, suppurative acute.
- Mastoiditis, suppurative acute.
- Otitis media, nonsuppurative acute.
- Epistaxis.
- Rhinitis, acute.
- Sinusitis, acute.
- Pharyngitis, acute.
- Tonsillitis, acute.
- Tonsillitis, follicular acute.
- Tonsillitis, suppurative acute.
- Laryngitis, acute.

The most distinctive feature of these diseases was their

comparatively mild character. It was, however, worthy of note that those cases showing ear, nose and throat complications developed these after admission to the hospital, giving the impression, especially in the more severe cases, that these manifestations occurred as late complications. Many reported for treatment after discharge from the hospital.

Early and free incision of membrane tympani was the rule, and it is firmly believed that rapid convalescence and the comparatively few mastoid complications were the direct result of early myringotomy.

In order early to detect ear complications a daily survey of the influenza wards was carried on with gratifying results. Not only did the special survey officer detect unsuspected cases, but the ward surgeons were on the qui vive for their development.

Postmortem study of cases of influenza and bronchopneumonia without mastoid signs was undertaken in twenty instances because it was believed that in certain cases local symptoms were so mild as to be overlooked. In these cases both mastoids were examined. In eight, one or both mastoids showed changes such as congestion, softening, milky or purulent fluid. Cultures of these mastoids showed bacteriological growth in only two, one being staphylococcus hemolyticus and the other pneumococcus.

Conclusion.—At the United States Base Hospital, Camp Lewis, every opportunity was given for thorough study of every case, original research was encouraged and hearty cooperation of chiefs of every department and that of the commanding officers was the rule.

XXVIII.

MILITARY SERVICE.*

OF

HANAU W. LOEB, M. D.,

ST. LOUIS.

Commissioned Major November 6, 1917.

Commissioned Colonel M. R. C., April 12, 1919.

I.—MANUAL OF MILITARY SURGERY OF THE EAR, NOSE
AND THROAT.

On December 1, 1917, I was assigned to duty in the Surgeon General's office in connection with the publications of the section of otolaryngology.

Under instruction of Colonel Parker, head of the Division of Surgery of the Head, and of Lieutenant Colonel Mosher, head of the Section of Otolaryngology, I proceeded to prepare a manual on Military Surgery of the Ear, Nose and Throat, for the use of otolaryngologists in the service.

Inasmuch as it was felt that the commissioned otolaryngologist did not require elementary instruction in otolaryngology, it was determined to summarize the war literature of otolaryngology, and to condense and to prepare it in such a way as to make it available for officers in service.

It was found that a vast amount of literature pertaining to the otolaryngology of the current war had accumulated and it was necessary to consult more than 1,100 books and papers in the accomplishment of the accepted task.

The text was completed on March 1, 1918, and the publication entitled "Military Surgery of the Ear, Nose and Throat" was issued about June 1st, under the designation "Medical War Manual No. 8, authorized by the Secretary of War and under supervision of the Surgeon General and the Council of National Defense."

*Symposium on Military Service of the members of the American Laryngological Association.

The book, which is of a convenient size for carrying in the pocket, consists of 176 pages, printed on thin paper. The chapters comprise the following:

1. Injuries of the External Ear.
2. Injuries of the Middle Ear.
3. Injuries of the Internal Ear.
4. Psychoneuroses of Hearing and Speech.
5. Reconstruction and Reeducation.
6. Miscellaneous.
7. Injuries of the External Nose and Nasal Cavities.
8. Injuries of the Accessory Sinuses.
9. Injuries of the Throat.
10. Injuries of the Pharynx and Esophagus.
11. Injuries of the Larynx and Trachea.
12. Paralysis in Connection with Wounds of the Throat.
13. Stenosis of the Larynx and Trachea.
14. Miscellaneous Nose and Throat Conditions.
15. Malingering.
16. The Ear and Aviation.

The subject matter is divided into two portions: The first contains a more or less dogmatic expression of the writer's opinion, gained from his previous experience and from his study of the war literature; the second, under the heading of "Comment," offers a review of the literature in detail.

The preface contains the following: "Due acknowledgment is here made to the medical officers connected with the Section of Otolaryngology in the Surgeon General's office for their advice, interest and cooperation, which have been a source of great encouragement in the preparation of this little study of the Military Surgery of the Ear, Nose and Throat."

II. SURVEY OF HEAD SURGERY.

On April 12, 1918, I was assigned to prepare a monthly publication for the Division of Surgery of the Head, containing,

1. Abstracts of published articles on head surgery pertaining to the war.
2. Abstracts of published articles of special interest to the Division of Surgery of the Head.
3. Articles pertaining to this Division and reports of cases

by members of the Medical Corps and of the Medical Reserve Corps.

4. Any other matter deemed of importance to the Division.

The purpose of this publication as expressed in the first number was:

1. To provide medical officers with a condensed survey of the war literature of head surgery and of non-military literature of importance to those interested in head surgery.

2. To stimulate the writing of reports and of papers giving the result of study and experience of officers assigned to this Division.

3. To provide a medium by which such reports and papers may take a place in medical literature and be made available for those concerned in this branch of medical science.

The "Survey of Head Surgery" as the publication was designated made its appearance August 1, 1918.

There were altogether six numbers issued beginning with August, 1918, and ending with January, 1919, a total of 288 pages.

It was found very easy to secure the assistance of medical men, not commissioned, who gladly gave their time in the preparation of abstracts for this publication.

Special mention should be made to the following for their service in this regard:

Lieut. Colonel Harris P. Mosher, Lieut. Colonel G. de Schweinitz, Major Robert H. Ivy, Major G. V. I. Brown, Major Charles Bagley, Dr. Edward Jackson, Dr. Joseph Charles, Dr. Clarence Loeb, Dr. Wm. F. Hardy, Dr. Ernest Sachs, Dr. Sol Hyman, Dr. Charles Elsberg, Dr. Holbrook Lowell and Dr. Albert Miller.

III. OPERATIVE SURGERY OF THE EAR, NOSE AND THROAT.

During this period, with Lieut. Colonel Mosher, I was also engaged in preparing a manual on Operative Surgery of the Ear, Nose and Throat for the use of commissioned otolaryngologists. Almost half of the text was completed when the armistice brought an end to the work as well as to the necessity for continuing it. A number of drawings of unusual excellence were made by Corporal I. F. Summers, who was assigned

for that purpose by Col. W. S. Owen, Director of the Army Medical Museum.

IV. SERVICE AT JEFFERSON BARRACKS POST HOSPITAL.

On October 1, 1918, I was assigned for duty at Jefferson Barracks, Mo., and was placed in charge of the Otolaryngologic department of the Post Hospital.

Shortly after my arrival, the influenza epidemic appeared and of the 7000 men on duty at that post over 2000 were affected, nearly 400 being attacked by pneumonia with approximately 150 deaths.

The epidemic lasted three weeks, though of course, the complications continued for a longer period. Casuals came in from time to time, but the Post epidemic practically subsided in three weeks.

1. Ear complications of influenza. Altogether there were 50 cases of ear involvement, limited almost exclusively to the middle ear and external auditory canal.

Myringotomy was performed as soon as there was the slightest indication. Within two days the discharge had ceased in all but two cases and the tympanic membrane speedily resolved without complication.

In one instance the discharge continued for a week and in another case, a bilateral otitis media, it persisted for a month, in the typical way.

The acute middle ear condition was frequently accompanied by blister formation in the external auditory canal.

Mastoid tenderness occurred in one case for two days and in another for a week, both recovering without operation.

One case of meningitis followed by death occurred, but there was no evidence of aural origin either from the symptoms or from the myringotomy which was performed for exploratory purposes. No autopsy.

2. Nasal complication of influenza. There was almost no nasal inflammatory accompaniment of the disease. In only a single instance was there a suspicion of frontal sinus involvement and this cleared up within a week without evidence of suppuration.

3. Pharyngeal Complications of Influenza. Most of the patients had a mild pharyngitis, some with mild tonsillitis, one

with a peritonsillar abscess, but in this case the presence of influenza might have been doubted.

Shortly after the epidemic several companies of negroes came from Camp Funston. Within a few days a very large percentage of them were taken with an acute lacunar tonsillitis, quite different from the throat condition which accompanied the influenza epidemic.

4. Larynx Complication of Influenza. A few cases of acute laryngitis occurred, but they were soon relieved in the usual way.

Two cases of laryngeal ulceration were observed greatly resembling those described by Major F. D. Owsley (Survey of Head Surgery, Nov. 1918, p. 94) one very mild lasting two days, the other bilateral persisting for a week.

5. Impressions derived from a study of the otolaryngeal manifestations of the influenza epidemic. The otolaryngeal manifestations of the epidemic as I observed them bore no resemblance to those of previous so-called influenza epidemics. The difference between them is so marked that I cannot see how they can be identical. If they have the same primary cause, it must be susceptible of great modification by circumstance, when the effects are considered. The otolaryngeal differences between this epidemic and those previously observed by me were:

1. Infrequency of otitis media suppurativa and its rapid resolution.
2. Absence of mastoid and intracranial complications.
3. Absence of paranasal sinus involvement.
4. Absence of lacunar tonsillitis and other manifestations of severe tonsil infections.

V. DISCHARGE.

I was honorably discharged from service, December 11, 1918.

VI. CONCLUSION.

Military service was an unexpected incident in my medical life. Even for some time after the declaration of hostilities, I had thought that my administrative duties in connection with the Deanship of the St. Louis University School of Medicine

justified me in not applying for a commission, more especially in view of the Surgeon General's advice in this respect.

However, Drs. Richardson and Mosher soon convinced me that the school requirements should give way to the country's call, and I can never fully express my gratefulness to them for the opportunity which they gave me to serve.

My experiences have been pleasant in every respect, my superior officers were considerate and helpful and my associates courteous and devoted to their duties.

It was three months after my application was made before I was commissioned. To obviate this in the future, I have accepted a commission in the Officers' Reserve Corps, which I hope to hold so that I may be ordered to duty hereafter whenever I am needed without waiting for the formality and delay which application for a commission entails.

XXIX.

WAR ACTIVITIES*

OF

MAJOR JOHN L. LOWMAN, M. D.,†

CLEVELAND.

Dr. John H. Lowman was commissioned a Major in the American Red Cross and was made the Medical Director of the Red Cross Tuberculosis Commission to Italy.

He sailed from New York on September 18, 1918, and landed at Bordeaux. The commission then went to Paris and after a short stay there proceeded to Rome. A few days after reaching Rome, Dr. Lowman was taken seriously ill with influenza. In spite of his illness, he was vitally interested in the work in Italy and kept in constant touch with the men on the medical staff. During the month of December, 1918, he was able to be in his office for consultation with the other medical men, but his physical condition was such that it was deemed wise for him to return to America, and he sailed for home early in January, landing in New York on the 21st day of January, 1919. He went directly from the ship to the New York Hospital and died there on January 23, 1919.

His military record is typical of his whole life. He gave, without limit, of his ability for the benefit of others.

*Symposium on Military Service of the members of the American Laryngological Association.

†Written by a friend.

XXX.

A BRIEF REPORT OF THE ACTIVITIES OF THE
DEPARTMENT OF OTOLARYNGOLOGY OF
THE AMERICAN EXPEDITIONARY FORCES,
FRANCE.*

BY COL. JAMES F. MCKERNON, M. C., U. S. A.,

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This paper is a copy of the one presented to the American Otolological Association at Atlantic City, June, 1919, and is published here by the courtesy of the American Otolological Association.

In presenting to you a brief history of the Otolaryngologic Department of the American Expeditionary Forces, I can perhaps do no better than to give you at first a general outline of what the department was at the time I was appointed Director and Senior Consultant. At that time it had not arrived at the dignity of the above name, but was known as the Department of Ear, Nose and Throat Surgery, and was merely an offshoot of the department of general surgery.

The first duty of the Chief Consultant was to list all the Base, Camp, Evacuation, Mobile and Field hospitals and divisional areas thus far established, with their personnel and equipment. Second, to obtain a list of the otolaryngologists already on duty in France and England and to classify them. Such a list was not available in the Chief Surgeon's office. This necessitated visits to all the various hospitals as well as to the divisional training areas. His third duty was to obtain if possible a classified list of all the otolaryngologists in America who were available for overseas duty. For this list and for others that followed, the thanks of the department are due to Colonel Parker and to Lieutenant Colonel Mosher of the Surgeon General's office.

*Symposium on Military Service of the members of the American Laryngological Association.

The inspection of hospitals showed that when the Senior Consultant was given charge of the department there were seventeen Base Hospitals actively functioning, with only one otolaryngologist on duty in each. There were already fifty Camp Hospitals established, thirty of which were not functioning. Only ten of those actively functioning had an otolaryngologist assigned to them. The total roster of officers doing ear, nose and throat work for the American Expeditionary Forces at this time was thirty-two. Following is a summary of the equipment or rather the lack of equipment for this work in the hospitals of the American Expeditionary Forces at that time.

Base Hospitals.—One-third of the Base Hospitals operating were lacking in instruments and equipment to adequately care for the patients they were receiving.

Camp Hospitals.—Of those functioning, only two had sufficient instruments and equipment to properly care for cases.

Evacuation Hospitals.—In only one was an otolaryngologist on duty, with practically no instruments or equipment with which to work.

Mobile Hospitals.—None of those established early had an ear, nose and throat surgeon connected with it.

Field Hospitals.—In none of those functioning was there an otolaryngologist or any instruments or equipment for use in this department.

Divisions.—There were six otolaryngologists on duty with various divisions. Later the number was increased as requisitions were made, but at no time during activities were there sufficient officers from this department to meet the demands made upon it.

From the above summary it will be seen that in reality there existed no ear, nose and throat department except the service in the seventeen Base Hospitals, and in those there was no uniformity of standard as to the work performed. This lack of available men on the ground coupled with the fact that only a small number were occasionally landing in France and England, handicapped very much the early activities of the department. It was found also that while there was an ear, nose and throat man assigned to each of the Base Hospitals, he was supposed to remain there, and for the first six months this

ruling held good, even though in many instances two or more men were assigned to the same hospital; and even though some of these hospitals were not actively functioning at the time, their Commanding Officers with few exceptions, would not allow the officer an assignment for temporary duty elsewhere.

By May, however, we succeeded in obtaining competent men from many of the Base Hospitals, replacing them for the time being with men who were arriving, or with men who had been tried out on front line work and were found more suitable for Base Hospital work. With these men obtained, and with others who were arriving from time to time, all of our Evacuation and Field hospitals at that time were manned, and the remainder assigned to divisional work.

Before an otolaryngologist was assigned to duty with the divisions, it was not unusual to have from 250 to 400 men report sick each morning to the Divisional Surgeon. At least one-half of these cases were suffering from colds and minor complications resulting therefrom. The usual mode of procedure at that time was to send these men to some Base Hospital in the rear, where they were treated for a few days, and then sent to a replacement depot, where they were held from three to six weeks, and then finally returned to their organization. As soon as an otolaryngologist was assigned to duty with these divisions an infirmary or dispensary was constructed, and at least 50 per cent of the men presenting themselves for morning sick call with colds and their sequelæ were treated and returned to duty the same day. Of the remaining 50 per cent, about 40 per cent remained in the infirmary and received treatment for from one to three days, and were then returned to duty with their organizations, thereby saving transportation and loss of man power, both of which at that time were sadly needed. The remaining 10 per cent it was found necessary to route to Base Hospitals, where they received the more protracted care and treatment needed.

This system which was first put into practice by this department was later adopted in the divisions by every department of medicine and surgery, the net result being a conservation of man power when most needed as well as a welcome relief to an already overcongested transportation service. While

some of the Base Hospitals were well equipped with instruments and supplies, the majority were not, and this was especially true of those that came over during the summer and autumn. Many of these upon landing had no instruments or equipment whatever with which to function, the result being that much valuable time was lost to the service at a period when every hospital and man was sadly needed.

Our Medical Supply Depots at no time carried sufficient instruments and supplies to properly equip a hospital in an emergency, and those instruments they did supply for our department were so few in number and so antiquated that had it not been for the fact that many of the medical officers brought their own instruments hundreds of cases could not have received treatment at all, for with the exception of buying an instrument here and there that had been discarded by the French during the earlier period of the war, none could be obtained in France. Later, however, this scarcity of instruments and supplies was not such an acute problem, although the supply was always inadequate to the demand.

Hospital Centers.—Where several Base Hospitals were established at one place a set of buildings was assigned to this department, so that all the work in the center was segregated. Special wards and operating rooms were arranged, and examination and treatment rooms for ambulatory patients fitted up, and a staff formed composed of officers from the units of the Center. This obviated duplication of instruments and equipment, and resulted in better care for the patient, besides allowing the excess officers in the department to be made available for duty elsewhere.

Center Consultants.—In all the large Hospital Centers a Consultant was appointed whose duty it was to have a general supervision over the work of the Center and act as Consultant when called upon by the Center Staff or the individual units. This arrangement proved most satisfactory, resulting in a better care for the patient, besides maintaining a more rigid discipline for the staffs of the Center.

Among the duties of the Senior Consultant was that of visiting all the Base Hospitals as frequently as possible, seeing cases in consultation and operating when necessary, and consulting as to the needs of the service with both the Attending

Surgeon of the department and the Commanding Officer of the hospital. During activities visits were constantly made from one Evacuation, Mobile and Field Hospital to another, seeing cases in consultation and advising as to the proper care and routing the cases, and later following up these cases that had been routed to Base Hospitals in the rear, and consulting as to the nature and amount of reparative work to be done.

Care and Treatment.—Upon a request from the Chief Surgeon, a circular dealing with the care and treatment of cases in this department was prepared and sent to all hospitals in the American Expeditionary Forces, as many cases were being hospitalized unnecessarily for minor operative work. Upon receipt of this circular much of this unnecessary work ceased.

Classification and Standardization.—A working schedule for the classification and standardization of ear cases was submitted to the Chief Surgeon, believing that it would simplify the work in this department as well as aid the disability boards in classifying the cases that must come before them.

Routing.—When possible, all cases requiring immediate special reparative work were routed to hospitals in the advance zone, where this type of work could be best cared for and frequent observations made. Those cases that could be transported longer distances were routed to Base Hospital No. 115, where a special staff of officers for reparative work was located.

Records.—The ordinary history sheet used in the army was all that was required, but in many instances this was supplemented by a more complete history from a specialistic standpoint. All officers in the department were urged to obtain and keep complete records in full, and maintain a standard of uniformity. As Consultant I was frequently asked by both regular and reserve officers what need there was for an otolaryngologist being assigned to an Evacuation, Mobile or Field Hospital. At first my answer was "to care intelligently for case in his department." Later experience modified my views on this subject very much. I now believe the field of an otolaryngologist in an Evacuation, Mobile or Field Hospital is a limited one, owing to the fact that there are but few wounds that would naturally come within the province of the surgeon in this department that are not multiple, the majority of

which concern the general surgeon only. For this reason, especially when there are only a limited number of men available, it is unnecessary to assign a man from this department for duty at one of these points unless he has had a general surgical training that fits him to act as a member of a team doing general surgery. If a member of such a team can act in a general surgical capacity in addition to caring for those cases that by right belong to his department, in such a way only can an otolaryngologist be utilized to a maximum at these points. To assign and maintain one in the front area for this purpose alone would be wasting his time, as his services are more urgently needed in the Base Hospitals of the advanced zone and in large Hospital Centers where the special cases are collected. At these places the otolaryngologic surgeon is needed, where his judgment and skill can be utilized in caring for the acute conditions that present themselves, and for the reconstructive work that will follow on these cases that are to be salvaged for future line duty.

The cardinal principle of front line work in our department was following the example of the general surgeon, a debridement of the traumatized tissue and removal of all loose bone splinters and foreign bodies when present. Through and through penetrating wounds were closed primarily. In all cases where wounds were open and there was a tendency to contraction with increased separation of the edges, a primary suture was done in order to obtain a better cosmetic result for the future reconstruction work that was to follow. In penetrating wounds of the outer and superior wall of the antrum, no matter how produced, counter drainage was instituted from below. In bullet and shell wounds of the nose, where the bones were shattered, debridement followed by the removal of the loose splinters was the rule, but in no instance was there removal of any piece of bone where there was still an attachment of periosteum. These pieces were approximated as accurately as possible and held in place by some mechanical device so as to allow of nature's repair. In this way much bony structure of the nose was preserved, so that the reconstructive work could be made easier and the future result obtained more satisfactory.

All shell and bullet wounds of the auricle were treated

by primary suture. Impacted shell fragments in the external auditory canal were removed and the resultant wound treated by the open method in order to promote drainage, and later, when necessary, plastic procedures were instituted. In shell and bullet wounds of the mastoid process, removal and open treatment was the rule. In penetrating wounds of the skull in the region of the temporal bone of the nasal fossa, a debridement at first was all that was indicated. Later, when the X-ray had localized the foreign body and the patient's condition admitted it, an attempt at removal (which was many times unsuccessful) was made.

In localizing foreign bodies in the brain no instrument gave us as much help by its precision and accuracy as the Hirtz compass, and later this was used in all foreign body cases to the exclusion of all other aids. In no brain case was it permissible to further mutilate the brain tissue by digital exploration. If the foreign body could not be removed by a continuous flow of a warm saline solution or other nonirritating fluid from a syringe, or could not be extracted by aid of forceps, it was let alone, as experience soon taught us that many of the cases recovered by letting the foreign bodies remain in situ. When fractures of the skull occurred all depressed areas of the bone were removed. At first a mistake was made by removing too small an area. Experience taught the error of this, as subsequent hernias were far less liable to occur when a large amount of bone was removed. This is probably due to the fact that a large exposure produces a minimum amount of pressure from within, whereas a small opening makes for a maximum of pressure.

In all wounds of the throat and mouth the principles of general surgery were carried out, always keeping in mind that drainage was an important factor. In reconstruction work of the auricle where a greater portion of it has been destroyed a more satisfactory result was obtained by making casts or moulds and from these constructing an artificial auricle from what was known as Hemming's paste, rather than doing a plastic operation. These were easily placed in position and held by spirit cement and made to conform in color to any skin, and could be easily removed and replaced by the patient at any time. Artificial noses were made in the same way. In

some of the nasal injuries it was necessary for respiratory as well as cosmetic purposes to loosen all adhesions and elevate them as much as possible by inserting a piece of cartilage or bone to replace in a measure the trauma existing. In many cases it was found advisable to work on these patients in conjunction with dental surgeons, as appliances had to be fitted and incidental details worked out, and much better results were obtained by utilizing the help of one who had been specially trained in devising, making and fitting these appliances. In the reconstruction work done, no didactic rules could be laid down, as the reparative process depended entirely upon the size, location, shape and condition of the wound and the amount of tissue available for repair. Much less of the reconstructive surgery was done in France than was at first expected. This was owing to the decision made by the Chief Surgeon to return all soldiers to the United States that could not be made ready for line duty in a period of three to four months or less. This decision was in all probability due to our lack of beds at the time.

In many of the cases that confronted us it was quite as important to decide what should not be done as to say what should be done, and in this respect we learned a great deal from both our French and English colleagues, who, by the experience gained in the past four years, were in a measure able to say which cases should be operated upon and which should not. Eighty per cent of the work of the otolaryngologists in France was behind the lines except in the regimental area, and here as well as further back the bulk of it was much the same as that met with in civilian practice and consisted in caring for the acute conditions and their sequelæ. During the influenza epidemic the cases where possible were segregated, and all were treated with warm nasopharyngeal irrigations of saline and sodium bicarb. three times a day, using from a pint to a pint and a half at each sitting. This was followed by inhalations, and the air in the wards was kept as moist as possible. This unquestionably proved beneficial, lessening the cough and diminishing the duration of the attack. All mucous membrane irritations due to gas were treated primarily by local applications of lime water or bicarb. of soda. The laryngeal conditions were best controlled by intralaryngeal

injections of guaiacol, 2 per cent, and camphor and menthol, of each 4 per cent, in oil.

Considerable criticism was made by some of the men when a circular was distributed through the department relating to tonsils, namely, that no tonsils were to be removed except when markedly hypertrophied or diseased, and never during an acute process. This was made necessary by the wholesale removal of tonsils that took place the first few months, and many hundreds of patients were hospitalized unnecessarily until this order was enforced.

Ear Protectors.—At first there were many and various kinds. Later on all were discarded and gave way to the use of cotton waste moistened in oil or vaselin. This simple mechanical protection was sufficient, as it prevented concussion and maintained a maximum of hearing when worn. It was easy to insert and always obtainable.

Experience has taught us that all hospitals engaged in the care of the sick and wounded should be completely equipped and have the proper assignment of medical officers and nurses when ready to function; and that when assignments are made from the Ear, Nose and Throat Department to Evacuation, Mobile and Field hospitals those officers should be qualified to act as members of surgical teams, either as heads or assistants, as ordinarily there are not enough cases requiring special attention to occupy their entire time in these hospitals. There should also be a center of instruction established for officers of limited experience, so that they may be taught the modern methods of caring for battle casualties. One of the principal points brought forcibly to our attention was that in wounds involving anatomic parts that properly come under this department there was a too extensive debridement of the tissues. In some cases this was carried to such an extent that an immediate reparative process was impossible, owing to a lack of tissue with which to repair, for it should be remembered that in the regions of the ear, nose, throat and face as extensive a debridement is not necessary as in other portions of the body, because of the anatomic difference in the tissues.

Considerable difficulty was experienced in handling men that were assigned to the department from divisions and other medical organizations. Many of these men would claim to

be expert otolaryngologists and were assigned to this department because of this claim or because they were doing regimental line work and wished to make a change, stating that their former training had been entirely along otolaryngologic lines. These men with few exceptions, did not know the first rudiments of ear, nose and throat work, and as soon as this fact was established they were transferred to a casual medical camp and subsequently utilized in other capacities.

This brings up an important point for the future consideration of otolaryngologists, namely, that of standardization. Is a man qualified to practice this specialty simply because he claims to be a specialist in this line of work? Or should he pursue a course of study in this specialty at some recognized institution where, after a prescribed course, he be examined didactically and practically, and if successful in such an examination he be granted a specialistic degree? A man taking such a course at an institution chartered with the power to grant such a degree or diploma would at once, in the eyes of the medical world, be looked upon as competent to practice his specialty. If such a standardization were established the self styled specialist would in the future (as far as medical support is concerned) be a thing of the past. I feel strongly on this point and speak from experience because of some of the material with which this department was burdened under the guise of specialism.

During midsummer the calls for consultation work became so frequent that it was impossible to respond to all of them, and the appointment of a Junior Consultant was requested. This request was granted, and Major John B. Rae was appointed and assigned to headquarters for duty. This appointment was of great help to the Senior Consultant, as well as being of the utmost help to the department, as it made one or other of the consultants available at all times. During the summer plans were submitted to the Chief Surgeon requesting that one or more schools of instruction be established for officers of limited experience; that this instruction comprise a thorough course on the functional examination of the ear, as well as the routine and operative treatment of nose, throat and ear cases, and that it also include the teaching of reconstructive work in this department. Owing to the lack of avail-

able teachers it was not considered advisable to grant this request, but we were given a promise of establishing these courses later. The early signing of the armistice, however, disposed of any further plans the Chief Surgeon may have had toward establishing such a course of instruction.

In some of the camp hospitals only one man was needed to cover the service on the eye, ear, nose and throat. In these instances, through the courtesy of Colonel Greenwood, the Senior Consultant in the Eye Department, an exchange of men between the two departments was made. When the armistice was signed there were 238 officers on duty in the department, and twelve additional held in reserve. When the Third Army was ordered to occupy German territory all the hospitals accompanying them were manned by from one to three officers from this department, in charge of Major Rae as consultant, and all instruments and equipment for the special work that was to be carried on was placed with the Medical Supply depots accompanying the army and requisitioned for use as soon as the hospitals were functioning.

From a personal observation of the French and English hospitals where reconstructive head and face surgery was done, I would most strongly urge that in the event of the United States becoming involved in another war, similar hospitals be established, equipped and surgically manned and ready for work prior to the opening of hostilities, and not wait to see whether or not such hospitals were going to be necessary, as we were told to do in the early days of the war. In my opinion, it is just as necessary that such hospitals be ready to functionate at the beginning as it is that we have base hospitals, if we expect to do our duty as surgeons to the wounded. Such hospitals established early give to the patients a better functional as well as cosmetic result, inasmuch as it insures the work being done early by competent men who have previously specialized along these lines.

My warmest thanks and appreciation are due General Ireland as Chief Surgeon and Colonel Keller as Director of Professional Services, for the help and advice given me at all times. It was their cooperation that made it possible to organize and maintain the department on an efficient basis. To these officers and their associates who had charge of the

services in the base hospitals, my own as well as the thanks of the department are gratefully given. It was due to their loyal support and willingness to work at all times in any capacity that made the service efficient for the care of our sick and wounded.

XXXI.

OTOLARYNGOLOGY IN THE WAR.*

By COL. HARRIS P. MOSHER, M. C., U. S. A.,

BOSTON,

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From the nature of things, only necessary operations are permitted in the surgery of the Army. The stock operations in the sections of otolaryngology, therefore, have been myringotomy, mastoidectomy, submucous section of the septum, tonsillectomy, and the incision and drainage of peritonsillar abscesses.

The returns are not all in, so that the following table of operations is only approximate:

TABLE OF OPERATIONS.

Mastoidectomy (simple)	2,175
Mastoidectomy (complete exenteration, or radical), 3.6 per cent	72
Meningitis (complicating mastoid disease) deaths.....	22
Brain abscess (number of cases).....	15
Tonsillectomy	11,646
Tonsillectomy and adenoidectomy.....	2,396
Adectomy	584
Submucous resection	3,246
Peritonsillar abscess	1,199

There were 14,042 cases of tonsillectomy, with four deaths; two presumably from cocain, one from embolism, which occurred under anesthesia, and one from tonsillar hemorrhage.

The number of peritonsillar abscesses has been very striking. Camp Devens reported fifty in a month, and Colonel McKernon states that overseas one medical officer opened

*Symposium on Military Service of the members of the American Laryngological Association.

twenty-four in a week. As the total number which has occurred in the army in the United States is 1,199, there is good ground for saying that at least 1,000 more tonsil operations could have been performed with benefit. The majority of the tonsillectomies have been under novocain, procain or aposthesin, and all the patients, of course, have been adults. I consider it remarkable that so far only one death from tonsillar hemorrhage has been reported.

Thrombosis of the lateral sinus has not been very common. Three hemorrhages from the lateral sinuses have been reported, caused by spontaneous rupture of the sinus, four or five days after its exposure in a mastoid operation. The monthly reports bring out the fact that the mastoiditis following measles took a fulminating course and was characterized by early, painless and severe destruction of the cellular structure of the mastoid process. More than one observer has felt that the involvement of the mastoid was often a part of a general blood stream infection.

Holmes reported the cure of sixteen diphtheria carriers by the removal of the tonsils and the adenoids and one cured by a Killian operation. He reported also eleven cases in which nonvirulent diphtheria bacilli were found mixed with streptococci and pneumococci in the aural discharge of acute otitis media. Friedberg also reported a series of cases of chronic diphtheria carriers cured by operation. The above list gives the standard army operations.

Operations for the replacement of fracture of the nose, usually for mule kicks, the removal of nasal polypi and drainage of the antrum, are next in frequency. A few instances of nearly all the standard operations of otolaryngology are represented in the reports from the camps.

In the early days there were two foreign bodies in the trachea dental: a broach and a peanut; these were sent to Philadelphia to Dr. Jackson. A short time ago, at Oglethorpe, a quarter was removed from the upper end of the esophagus. Tracheotomy has been done a few times for edema of the larynx, probably caused by deep infection.

The following tabulation gives an idea of the amount of work done in one of the most active base hospitals, namely, Camp Sherman:

Number of new cases treated in the ear, nose and throat department	7,210
Number of operations performed in the ear, nose and throat department	2,227
Number of treatments given in the ear, nose and throat department	35,261
Number of deaths.....	10

At times rather too many secondary mastoid operations were necessary. In one series of 158 mastoid operations 28 reoperations were reported, and eight cases of facial paralysis, six of which were permanent. This is not a good record. Speaking of the character of the work, I said in a previous paper that, on the whole, it has been good; that it has fallen down in certain places—by this I mean that there were too many cases of facial paralysis in operations for acute mastoiditis, too many cases of reoperation, and at times, in a few places, that there was a suspicion of overoperating—is due to the fact that the otolaryngologists of the country who had the training to make the work better did not come in to the service in sufficient numbers to go around.

Leaving this very brief tabulation of operations and turning to a survey of the diseases with which the otolaryngologists has to deal, the reports from the camps show that there has been very little diphtheria. Almost no erysipelas has been reported in connection with mastoid operations, in spite of the fact that the streptococcus has been the reigning organism.

NEW CLINICAL OBSERVATIONS.

A number of new things have been picked up by the otolaryngologists in the cantonments. Major Owsley described a series of cases of ulcerative laryngitis due to the pneumococcus. He saw the cases at Camp Travis and labeled the process a new camp disease. It is distinguished by a superficial ulceration of the anterior ends of the vocal cords. The chief symptoms are hoarseness and aphonia. All of the cases responded readily to the treatment of solutions of silver. Major Eagleton at Camp Dix successfully placed a bone graft from the tibia in the cavity of the mastoid process produced by a simple mastoid operation. Major Eagleton feels that he has a new frontal sinus operation, and Major Fetterolf has

confessed to a new procedure for the resection of the nasal septum. Undoubtedly both of these operations will be reported later. At one of the base hospitals there was a run of hysterical aphonia, "Whispering Willies," as they were called. They were turned over to the psychiatrist, who had great success in curing them.

When I was in France a year ago I heard that Robertson had autopsied a number of cases of influenza which showed pus in the sphenoid sinus, the other accessory sinuses being free. Major Bryan, while serving at Walter Reed Hospital, Washington, went through a streptococcus epidemic, and the autopsies gave a similar finding. In addition, in one case there was an odd involvement of the epiglottis and of the larynx. In this war, therefore, the sphenoid sinus has come more and more under suspicion. Eagleton was on the watch to duplicate these findings, but in the autopsies which occurred at Dix the sphenoid sinus was not involved.

Holmes at Sherman and Harris at Oglethorpe have drawn attention again to the manifested advantage of the use of gas oxygen for producing the anesthesia for mastoid operations in pneumonia cases. Two other medical officers, Porter and Orton, have reported a series of similar cases which they operated under local anesthesia.

A report from Camp Zachary Taylor for the month of January, 1918, gives an account of 39 mastoid operations, five of the cases being bilateral. Bilateral operations were not so very rare.

Hill, in a study of the aural complications of the recent influenza epidemic at Fort Oglethorpe, came to the conclusion that in mastoid cases a drooping posterior, superior canal wall did not indicate a suppurative mastoiditis. He still has faith in the other classical signs, namely, increased purulent discharge, thickened periosteum, mastoid tenderness and edema. Major Scott, of Fort Riley, considers that in mastoiditis the chief indication for operation is bone necrosis as shown by the X-rays. The X-rays which he was able to obtain were unusually clear and so enabled him to place great reliance upon them.

The Carrel-Dakin solution, which has figured so largely in the treatment of empyema, naturally has been tried also in the

treatment of mastoid wounds. Eagleton feels that the solution gives a cleaner wound and hastens the healing. Scott advocates a dressing of chloramine paste for mastoid cavities. Dakin's solution has been used with good results at Cape May in clearing up cases of chronic running ear.

THE INFLUENZA EPIDEMIC.

The influenza epidemic, which reached the proportions of a plague, or as near a plague as this generation of physicians has ever seen, spent its virulence upon the lungs.

The following account of the epidemic from the otolaryngological point of view is from Shambaugh and duplicates the reports sent in from most of the base hospitals.

"About September 21, 1918, an epidemic (influenza) broke out in Camp Grant. The number of patients in the hospital increased from normal 500 to 3,600, with a daily admission rate running up to 800. The consultation work of this department was enormous. There were over 600 cases observed with otitis media acute suppurative. In most cases there was a spontaneous rupture of the membrane tympani within a few hours of the onset of ear symptoms. The discharge, as a rule, appeared thick and purulent from onset, and did not have the initial stage of a serosanguinous discharge so frequently met with in the ordinary case of otitis media. Many of these cases were complicated by a diffuse otitis externa and very few showed any mastoid reaction. Most of the cases recovered rapidly, that is, in about a week.

"There were, relatively, a small number of cases which showed distinct symptoms of acute sinusitis. Most of the sinus cases proceeded to spontaneous recovery. It seems probable that not a few cases of acute sinus infection passed undiagnosed. Not a single case of sinus trouble required operation.

"Epistaxis was a very frequent complication. The bleeding in these cases did not become serious and no special treatment was instituted to stop the bleeding.

"Culture were made from but a few of the cases. In three cases in which cultures were produced immediately following the paracentesis all showed a pure culture of

pneumococcus. In two cases in which cultures were produced from pus washed from the maxillary sinus both showed pure cultures of pneumococcus. Cultures were made from pus found in opening the mastoid in six cases. Four of these showed pure hemolytic streptococcus and one showed a pure culture of pneumococcus."

The initial epistaxis was a striking feature. Green found that it almost always came from a single vessel located in Kesselbarch's circle, but Buff found that it came from the turbinates.

Emerson had the distinction of being made commanding officer of a special influenza hospital of 1500 beds at Camp Lee, and made a striking success of it.

Eagleton experimented with suction for removing the secretion from the trachea of pneumonia patients just after death, his idea being to use it in the living if he obtained results. He found that the secretion was too thick to respond to suction.

The tragedy of the epidemic still awaits a full description. Patients were struck down with the suddenness of lightning. To say that the morgues of the hospitals were overflowing with dead sounds commonplace, because we have heard it said so often. It was, however, literally true. In the camps military funerals were taking place all day long and the hospital flag stayed at half-mast throughout the epidemic. At the railroad stations the coffins which were being slowly wheeled along or lay about waiting for a place in the baggage cars kept the scourge before the eyes of every traveler.

I remember the impression that the flu patients made on me as I went about the crowded wards at Oglethorpe. The virulence of the disease struck me like a blow when the medical officer who accompanied me said: "This man will be dead tomorrow, that one the day after," and none of the patients seemed to me so desperately ill. The fathers, mothers and wives and brothers sitting by the bedsides added to the tragedy and to the general hopelessness.

Only a few doctors died, but enough to show that they were not immune. At last two wives of doctors who either lived in the camp with their husbands or came to visit were

victims. One very sad case of this kind occurred at Oglethorpe. The wife of the pathologist died the day before I arrived. After talking it over with his commanding officer her husband decided to remain at his post and carry on his work in the autopsy room, assembling material while it was still available for scientific purposes. On the day of his wife's funeral one of the visiting physicians happened to be in the morgue at noon and found him crowded with work. The physician asked if he could be of any help. The answer was: "It would help if you could stay a little. At this hour my wife is being buried in New York." That was lonely devotion to duty which words of mine cannot adequately appraise.

SUMMARY.

In the beginning of the war the section of otolaryngology was the busiest of all the surgical specialties. At the present time it remains moderately active, but the section of plastic and oral surgery, now called maxillofacial surgery, and the section of neurologic surgery are receiving from overseas more of their special cases than the section of otolaryngology. The section of neurologic surgery is receiving by far the most cases, the majority of them being injuries of the peripheral nerves.

In the United States the two great medical problems of the war have been the control of sputum-borne diseases and the detection and cure of the carrier. The bacteria responsible for sputum-borne diseases gain their entrance to the body in most instances through the tonsils of the accessory sinuses. Experience has shown that the best method of curing a carrier is to remove the tonsils and the adenoid. The war has shown also the supreme importance of accepting in the army only recruits who have a normal nose and throat.

The war has shown further the importance not only of discovering carriers, but of segregating contacts. It has brought out the significant fact that the hospital personnel often act as carriers. In dealing with air or sputum-borne diseases the great value of isolation and the use of substantial gauze masks has been proved. The probable efficiency of the

routine spraying of the nose and throat with dichloramin-T has been shown. More experimentation, however, is needed to prove this point. The opinion now prevails that every recruit and every hospital patient should be looked upon as a possible carrier.

In the United States the dominant bacteria have been the pneumococcus and the streptococcus hemolyticus, the latter being by far the most important. The following fact has become more and more evident, namely, that assembling men in barracks, exposing them to cold, and drilling them to the point of over-fatigue has the power to change harmless bacteria into virulent strains.

In head surgery America's greatest contribution has been in the surgery of the jaw. Bridge splinting, the use of bone grafts, the implantation of cartilage to give form to plastic flaps, and the use of the skin graft folded over a plate of modeling compound have greatly advanced maxillofacial surgery.

The fact that so many tonsillectomies were performed with so few deaths from any cause, and only one death from tonsillar hemorrhage, speaks well for the skill of the operators and the type of operation employed. The striking number of peritonsillar abscesses would seem to show that even a larger number of tonsillectomies could have been performed with advantage.

The influenza epidemic was a dramatic and deadly scourge, but the complications produced in the line of otolaryngology were not serious. It emphasized the fact, however, that a normal nose and throat is a great protection.

The otolaryngologists have faithfully and enthusiastically used their specialty for the prevention of disease as well as its alleviation. Their first aim was preventive surgery, and they largely realized it.

In looking backward over our war experience, things are seen which could have been done much better. The following are some of them. Recording them may help another time, if there is another time:

The draft examination should have been more thorough. Too many cases of chronic running ears were overlooked.

There could have been closer cooperation between the camp

and the base hospital. There was no provision for an automatic interchange of special personnel.

Special instruments and supplies were late in getting to the hospitals.

Instruments, medical supplies and literature were late in getting overseas.

The hospitals at the port of embarkation should be thoroughly equipped and staffed. Soldiers destined for overseas often arrive at the port of embarkation seriously ill.

In the United States the power to act as consultant should have been given to the chiefs of the sections earlier.

Each medical and surgical section should have a medical officer to act regularly as courier between the home base and the base of operations.

XXXII.

PERSONAL OBSERVATIONS IN OTOLARYNGOLOGY
IN FRANCE DURING THE WAR.*

BY MAJOR FRANCIS R. PACKARD, M. C.,

PHILADELPHIA.

Any remarks I may have to make on the laryngology and otology of the war must be of a more or less discursive nature because of the comparatively late time at which I became officially connected with the otolaryngologic service of the A. E. F. I sailed May 17, 1917, with Base Hospital No. 10, the Pennsylvania Hospital Unit, which assumed charge, in June, 1917, of British General Hospital No. 16 at La Treport, France. The hospital had 2,000 beds and was used only for acute cases, patients being evacuated to England or to a convalescent camp or to their units as rapidly as possible. We were one of five or six other British hospitals, located in close proximity. Our hospital received chiefly wounded and gas cases, but also had attached to it a contagious division, which received many cases of diphtheria, scarlet fever, measles and Vincent's angina. The otologic, laryngologic and ophthalmologic work of the entire hospital area had been in charge of Dr. MacDonald, of the Canadian Army Medical Corps, a most competent man. We had brought with us an ophthalmologist as well as myself to look after the eye, nose, throat and ear cases, but neither of us found much to do. Practically all operative work, except for wounds or acute conditions, was forbidden.

Tonsil and septum operations and radical mastoids were forbidden, and consequently, except for occasional foreign body cases in anatomic regions which fell within my province and for occasional cases in the Isolation Division with ear and throat conditions, my duties were very light. I was very forcibly impressed, however, with the very great number

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of aural cases which occurred among the men and which in civil life should have received appropriate treatment but which were necessarily neglected, owing to the exigencies of active war service. I refer to traumatic ruptures of the membrana tympani, due to concussion, to chronic suppurative conditions of the middle ear with acute exacerbation due to exposure or neglect, and to chronic nonsuppurative disorders of the middle or internal ear, due chiefly to exposure to concussion in artillery fire. Most of the traumatic ruptures of the membrana tympani had developed suppuration, chiefly owing to their having been douched when first seen. Chronic purulent otitis media appeared to be entirely disregarded as a disability, and I operated on several cases which had developed acute mastoid symptoms as a result of exposure and neglect. Even a quite marked degree of deafness did not exempt the enlisted man, and of course such cases became greatly aggravated.

After some three or four weeks at the hospital I went up to a casualty clearing station with a surgical team, being officially designated as anesthetist. I was very glad of the opportunity to get to the front and felt that I could be better spared from the hospital than most of the other officers, as my duties were so light. There was absolutely no work in our specialty at the front, but there was plenty of work of other kinds. After remaining three months at the casualty clearing station I returned to British General Hospital No. 16. The hospital was now receiving a great number of gas cases, and the laryngeal lesions were most interesting, but chiefly from the pathologic point of view, as there was unfortunately but little that could be done even by the way of alleviating their sufferings. The patients were chiefly suffering from mustard gas, which caused a deep burn through the mucosa involving the underlying tissues and extending from the mouth well into the bronchi. No local applications were of any avail in the pronounced lesions. In slight ones intratracheal injections by means of a syringe of liquid vaselin containing menthol, camphor or oil of eucalyptus seemed to lessen the pain and irritation.

In September, 1918, I was detached and sent to Paris as center consultant in otolaryngology. There were a number of large American hospitals in the center, notably American

Red Cross Military Hospital No. 1 at Neuilly, American Red Cross Military Hospital No. 2 and American Red Cross Military Hospital No. 3, and U. S. Base Hospital No. 41 at St. Denis and No. 4 U. S. Camp Hospital at Joinville. Excellent work was done at them by the otolaryngologists attached to their respective staffs, notably Majors W. Sohler Bryant, Hubby, and H. E. Tucker. There were many mastoid and sinus cases, particularly in connection with the pneumonia and influenza epidemics. The hospitals were well equipped, owing to the energy and foresight of Lieut. Col. James F. McKernan, chief consultant in otolaryngology for the A. E. F., a fact which won the envious admiration of some of our French colleagues who visited them and were most favorably impressed. I, in turn, was much struck with the excellence of the otolaryngologic service in the French military service at Paris. I visited a number of the clinics, notably those of Luc and Lubet-Barbon, and found much to admire and but little to criticise.

XXXIII.

MILITARY SERVICE*

OF

MAJOR NORVAL H. PIERCE, M. C., U. S. A.,

CHICAGO.

Commissioned Captain, M. R. C., April, 1917.

Entered active service June, 1917, in charge of the Otolaryngologic Department of Illinois Charitable Eye and Ear Infirmary Unit, for Examination of Aviators. Promoted to Major, August 11, 1918. August 31, 1917, was appointed Chief Consultant in Otolaryngology, Camp Grant, Ill. June, 1918, ordered to U. S. General Hospital at Cape May. Sailed for duty with Base Hospital No. 115 at Vichy until December, 1918, when I was ordered to St. Nazaire for duty. January, 1919, ordered to Camp Hospital at La Boule. At Vichy served for a time as Chief Consultant in General Surgery for the Base Hospital center. Afterwards as Consultant in Otolaryngology for the center, as Chief of the Division of Surgery at Base Hospital No. 115. Ordered home February 11, 1919. Time of service, nearly two years.

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XXXIV.

BRIEF HISTORY OF THE EMORY UNIT.*

BY SURGEON IN CHARGE MAJOR DUNBAR ROY, M. C., U. S. A.,
ATLANTA.

The writer entered the service of the Surgeon General's office on June 10, 1917, as Contract Surgeon. This was in response to a telegram to Maj. T. R. Bratton (now Col. Bratton, Commanding Officer at Fort McPherson, Ga.), requesting him to see if the writer would not form a voluntary unit for the examination of men for the Air Service. This was done on June 10, 1917, and the writer's clinic rooms of the Medical Department of Emory University were utilized for holding the examinations.

The personnel consisted of my assistants in the Otolaryngological Department and those of the Medical Department in the university.

The Aviation Board was located at the Georgia School of Technology in Atlanta. The same personnel of the unit continued until orders were received instructing us to examine no further men. This was on February 21, 1918. The unit, therefore, of which the writer was commanding officer, was in existence for eight months.

During this time we examined between thirteen and fourteen hundred men, the large number being due to the many cantonments which were located in this section, and the fact that Atlanta was the center to which men could come in the shortest period of time and with the least inconvenience. It is permissible here for the writer to state that a higher commission was offered him but was refused on the ground that his duties in the Medical Department of Emory University were urgently needed, and it was understood with the Surgeon General's office that if he was willing to keep the rank of First Lieutenant, they would see that he was not transferred from Atlanta.

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But few medical observations were made which differed from those already recorded by men working in the aviation units in different parts of the country. One could not fail to have some practical ideas of his own after having had thirteen hundred men under observation and seen the results of the various tests recorded in these examinations.

The one outstanding observation presented to the writer was the neuropsychic element which existed in all the men who presented themselves for the examinations and tests. There had been so much written and discussed concerning the severity of those tests that the large majority of men approached them with fear and trembling. I am fully convinced that many good men were rejected because this influence on their nervous system was not considered. To take these men into the examination room, yell at them in bombastic tones, upset their whole nervous mechanism with fear, what could be expected from them when delicate tests were applied? As Commanding Officer I always attempted to rectify these defects in the examining unit, and I personally saw to it that each examiner showed mild courtesy to every applicant. In many cases I allowed the man to be examined again the next day, especially if he was of a nervous temperament and had lost sleep in an all night's travel upon the train. This report, however, is not for the purpose of discussing the methods used in these examinations nor the consideration of the importance of one test over that of another. This has been done quite extensively by others, perhaps better qualified by reason of their longer service in the Medical Corps. The writer believes that the eye tests were of more practical value to the men than those of the ear.

Three of these eye tests stood out most prominently: (1) Acuteness of vision, (2) Orientation by means of the stereoscopic test and field of vision, (3) Color perception.

On April 2, 1918, the writer was placed on the inactive list and the Emory Unit was discontinued.

XXXV.

MILITARY SERVICE*

OF

COLONEL CHARLES W. RICHARDSON, M. R. C., U. S. A.,

WASHINGTON.

Dr. Richardson was commissioned a First Lieutenant in the old Medical Reserve Corps, July 5, 1908. Commissioned a Major, Medical Reserve Corps, April 25, 1917. Commissioned a Lieutenant-Colonel, National Army, May 20, 1918. Commissioned Colonel, February 19, 1919, M. R. C.

During the early part of the war Dr. Richardson was employed in numerous inactive and active duties. Among the latter was the chairmanship of the Otolaryngologic Section of the Division of Surgical Specialties, Council of National Defense. During this period Dr. Richardson, with his able assistants, got out all the questionnaires, classified those that were returned, and compiled a card index of the same. During this period also Dr. Richardson was on active duty, making a tour of some of the larger cities in the country for the purpose of increasing enthusiasm among otolaryngologists and thereby increasing volunteers among the physicians in this line of the profession. Later he was again placed on inactive duty. He was created a special commissioner on legislation to see that important active legislation did not take away from the Surgeon General the rights of reconstruction, which was accomplished.

On October 24, 1917, he was placed on active duty, which he continued until his discharge. During this time he was assigned to the Otolaryngologic Section, Division of Surgery of the Head, as acting chief, in the absence of Major Mosher, on a mission overseas. Various activities arose, among the most important of which was the creation of the Army Medical School at Fort Oglethorpe, and the arrangements made

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for the Section of Otolaryngology. These were finally completed by Lieutenant Colonel Mosher on his return.

On March 11, 1918, Dr. Richardson was assigned the directorship of the Defects of Hearing and Speech in the Division of Physical Reconstruction. He organized and assigned the personnel, sought the proper habitat for the patients in defects of hearing and speech, and carried out further details in order to make the undertaking a success. During the period of the war 140 patients returned deaf and required speech correction. Of this number of returned patients, over 70 per cent made excellent speech readers. Eighty per cent of the corrective speech cases were excellent, demonstrating the character of the work done. The methods employed met with the approval of all those who had the pleasure of seeing the patients and the work done.

From September 10 to October 30, acting chief of the Division of Physical Reconstruction, during the absence of Colonel Billings overseas.

During his service in the office of the Surgeon General it was always Dr. Richardson's pleasure to aid in advancing the grades among the officers who deserved it, assisting in securing the discharges of officers when it was requested, and doing various acts for the many officers in the service in the section of otolaryngology.

XXXVI.

MILITARY SERVICE*

OF

MAJOR GEO. E. SHAMBAUGH, M. C., U. S. A.,

CHICAGO.

One year's experience in keeping home fires burning.

Experiences at Camp Grant: Otolaryngologic work in the wake of the influenza epidemic. Mastoiditis following influenza, requiring surgical interference. Slow formation of mastoid abscess without symptoms (latent mastoiditis). Type of acute sinus infection following influenza. Efficiency of intranasal drainage for cases requiring surgical interference. Peritonsillar abscesses as a sequel of influenza. Experiences in examining overseas cases suffering from injury to the hearing.

The first year of America's entry into the world war was for me a rather strenuous one. What with teaching at Rush College, giving of special courses for surgeons who were taking up neurologic surgery, writing of chapters for a war manual on Neurologic Surgery, and not least, serving on a medical war board in the evenings, I found my time fully filled, and during this period I acquired a profound respect for those of our profession who were destined to stay out of the regular service in order to keep home fires burning. Nevertheless, as the year wore on, I felt an increasing desire to enter service, and in the spring of 1918 I began to make efforts to get my release from the list of essential teachers, where, as the head of a department in Rush Medical College, I had been assigned when the country entered the war. My release came during the summer, when, taking my examination, I arranged for my courses at the school and awaited my commission and assignment.

It was not until the morning of November 11th, while watching the demonstrations from the window of my office

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on that eventful day, that the telegram came from the War Department notifying me of my commission and assignment for duty at Camp Grant. I arrived at the camp just after the epidemic of influenza passed over that place and have been at work there until the present time. It was an interesting period when I began my work as Chief of the Department of Otolaryngology at the Base Hospital. The influenza had brought with it a great many cases of acute otitis media as well as acute sinusitis, and while there were a great many cases of acute otitis media in which distinct clinical symptoms of acute mastoiditis were manifest, there were indeed very few which presented the fulminating symptoms requiring surgical interference. There were but few exceptions among these cases presenting well marked symptoms of acute mastoiditis during the early days of the otitis media which did not clear up spontaneously in the course of ten days or two weeks.

During the month immediately following the influenza epidemic we met with a rather large number of cases of mastoid disease where the trouble developed often without any external evidence of mastoiditis. These were cases where there was no tenderness over the process and no changes in the overlying structures. In a number of these cases there would be weeks pass with no elevation of temperature or at most 99 degrees, once or twice during an entire week. The diagnosis of abscess cavity in the mastoid process was made by the persistence of a purulent as distinguished from a mucous discharge, which may or may not be profuse. In some cases there was the characteristic flattening of the upper wall of the external meatus, and in some a more or less persistent pain in the temporal region of the same side. It was in just these cases where we found the skiagraph to be of greatest assistance in showing the areas of softening in the depths of the mastoid process. Usually there was but one abscess cavity, the location of which, as well as its extent, was distinctly shown on the plate. On the other hand, the shadow, which is always shown in the skiagraph in the early stages of otitis media, especially where mastoid symptoms are present, was not of special assistance, for we were aware without the assistance of the plate that the pneumatic spaces were filled with inflammatory secretions, and the plates themselves did

not give us, as a rule, a definite clew as to whether an actual softening of the bone was taking place.

Our experience with acute sinus cases was very much the same. A great many influenza cases were complicated with well marked symptoms of acute sinusitis. The skiagraph was not at all necessary in making the diagnosis in most of these cases. No local treatment other than the intranasal application of a weak solution of adrenalin and cocain to the nasal mucosa was called for. In only a few, where the symptoms were severe and failed to subside promptly in a few days, did we resort to irrigation. In the case of the maxillary sinus this was carried out by means of the Killian tube, puncturing the nasal fontanelle in the middle meatus. Later on, there were a few cases where the sinus infection became chronic or where the lighting up of an old chronic process persisted in discomfort associated with a profuse purulent discharge from the nose. In such cases we proceeded to establish intranasal drainage, first by removal of the concha media associated with the making of a large opening into the maxillary sinus through the middle meatus, the exenteration of the anterior ethmoid cells and the enlarging of the nasofrontal duct, as the case might require. The skiagraph always gave a quick and satisfactory answer as to the sinuses involved. In a few cases the antrum alone was affected, and occasionally the frontal sinus alone was involved. In none of the cases was an external operation necessary.

For a couple of months following the influenza we saw a great many cases of peritonsillar abscess and not a few post-pharyngeal abscesses. In most of these cases a pure culture of streptococcus was found. For a time we saw as many as five or ten such cases in a day. Not a few cases of systemic infection followed from these infections and from cases of acute tonsillitis. These complications were chiefly in the nature of rheumatism and endocarditis and occasionally acute Bright's disease. These infections brought to our service a great many cases where the removal of the tonsils was required.

Later in the service, when the overseas wounded began to pour into the camp, and as the demobilization of the overseas units proceeded, we had opportunity for observing a great

many cases of injury to the organ of hearing. The cases which presented symptoms of defective hearing gave opportunity for applying accurate methods of diagnosis, especially in the application of the functional tests to the organ of hearing and to the vestibular mechanism. Owing to laxity of examining boards in some quarters, not a few cases were inducted into service which were suffering from chronic suppurative otitis media, and not a few cases of defective hearing, especially of the otosclerotic type where the drum membrane was normal. These facts made it important that our examination of the retiring soldier should determine not only the degree of disability but should differentiate those cases where the disability had been incurred while in service from those where the defect was clearly due to preexisting ear disease.

The work has been on the whole extremely interesting. Not the least has been the stimulation which all of us felt from coming into contact, as we did, with the finest specimen of manhood in the world, the American doughboy. This experience has in itself been ample compensation for all the petty annoyances incident to military life.

XXXVII.

MILITARY SERVICE*

OF

LIEUT. COL. BURT R. SHURLY, M. C., U. S. A.,

DETROIT.

Dean of the Detroit College of Medicine. Member of the Committee of Three, in company with Dr. Charles W. Richardson and Dr. Harris P. Mosher, to represent the American Laryngological Association, the American Otological Association, the American Medical Association and the American Rhinological, Laryngological and Otological Association for the purpose of conferring with Surgeon General Gorgas as to the employment of specialists in the Medical Corps of the U. S. Army.

Resigned from this committee, entered active military service and was commissioned Major July 25, 1917.

Organized and was appointed Medical Director of the Detroit College of Medicine and Surgery Base Hospital No. 36. Sailed October 27, 1917; arrived November 10th, and was stationed at Vittel, France.

Commissioned Lieutenant Colonel June 6, 1918.

Sailed from France February 8, 1919. Arrived home February 17, 1919. Honorably discharged March 12, 1919. Duration of service, 20 months.

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XXXVIII.

LARYNGOLOGY IN AN AMERICAN BASE HOSPITAL
CENTER, FRANCE.*

BY ROSS HALL SKILLERN, M. D.,

PHILADELPHIA.

In a retrospect of the work accomplished during the latter months of the war, when the specialties with special reference to the upper respiratory passages should have reached a comparatively high state of development and efficiency, it is with no small sense of disappointment that one mentally reviews the conditions that were to all intents and purposes universally met with in France during that period.

The writer was stationed at Mesves sur Loire, one of the largest American hospital centers abroad, with actual accommodations for twenty thousand patients, including the convalescent camp. The center was composed of ten base hospitals, each with the capacity of two thousand beds, including the crisis expansion. The individual base hospital units were complete entities with their own operating rooms, laboratories, X-ray departments, etc., and were understood to be in a position to properly treat any case that might come under their care. As a consequence, during the early days of the center, no differentiation was made, but only at a later date were certain units designated to care for special cases, thus contagious diseases to one, influenza and pneumonia to another, orthopedic cases and fractures to another, etc., but I do not recall anyone designated for nose and throat cases.

It is true that a unit did set aside one or two wards for head cases, but these were more particularly mouth and jaw injuries, and were under the supervision of a dentist and oral surgeon. Each hospital unit was equipped with a field set for nose, throat and ear cases and was supposed to have one room solely for this work, but as this specialty was never en-

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couraged this room was seldom in evidence. Despite these discouragements, certain laryngologists endeavored to organize their departments, but on account of the apathy of those in command, together with the inefficiency of the medical supplies and the lack of adequate lighting and water supply, the result was rather crude and totally inadequate for even the proper examination of the patients. Small wonder is it then that little encouragement was held out to patients requiring the use of the nasal or laryngeal speculum.

ACTUAL CONDITIONS ENCOUNTERED DURING THE GREAT INFLUX
OF PATIENTS FROM THE MEUSE-ARGONNE OFFENSIVE.

This time is chosen, as it was the greatest and most comprehensive effort of the United States to turn the tide of battle and as a consequence was fraught with great casualties, but was worth the price, as it was this drive that definitely overcame the military superiority of the Germans and caused them to lay down their arms.

Train loads of sick and wounded arrived with such frequency that the capacity of the center was soon taxed to its utmost, all available bed space being occupied. The character of the cases was rather curious. One would naturally suppose that those suffering with wounds would be in the preponderance while, as a matter of fact, the sick, shell shocked and gassed constituted about 50 per cent of the total, at least as far as our center was concerned. Of these the most interesting, laryngologically speaking, were those that had been gassed, not considering the very exceptional throat wound cases. These gas cases were placed on the medical side and treated by the internist with occasional examination and advice from the staff laryngologist. (It must be remembered that the laryngologist was detailed as a ward surgeon and had little opportunity to devote time to his specialty.)

The symptoms in these gassed patients depended upon the concentration of the gas and the length of time it was inhaled. Like the severe wounds of the throat, those badly gassed were sent to hospitals near the front so as to avoid any transportation that was not absolutely necessary. As a consequence, we received only those cases that could be called moderate. On admission these patients were usually

ambulatory, stating they had been exposed to the fumes of mustard gas, but did not appear to be suffering nor did they, as a rule, complain greatly. They were at once placed in bed and not permitted to smoke, although most of them had already desisted, as the tobacco seemed to have a peculiarly unpleasant taste. This was one of the earlier symptoms of gas poisoning.

After three or four days, the cough became more distressing and the laryngeal mucosa affected, which manifested itself by various degrees of hoarseness to complete aphonia. While, of course, this was due to the direct irritation of the gas, nevertheless, in my experience the psychologic element entered largely into the aphonia. Inspection at this stage revealed an intense hyperemia of the faucial structures which extended down into the larynx, the cords being red, thickened and relaxed. The parts were exquisitely sensitive and were difficult to cocainize, making the examination more or less tedious. Local treatment seemed to have little influence on the affection, and in five or six weeks it had usually ameliorated to such an extent that the patient could be sent back to his organization.

The grave form of gas poisoning was a much more serious proposition. Only one case of this character came under my observation and in a German prisoner; a more distressing example of suffering I have never seen. The dyspnea was marked and accompanied by a persistent cough which continued during the night and was very difficult to control. Expectoration was scanty, thick and sometimes streaked with blood; the voice had completely disappeared.

It was difficult to make an inspection, partly on account of the condition of the patient but mostly on account of the lack of facilities where he was confined. It was, however, plain that the entire mucosa of the upper respiratory tract, with the exception of the nasal, was intensely inflamed, red, swollen and covered with a grayish, dirty exudate. The interlaryngeal structures (arytenoids, aryepiglottic folds and ventricular bands) were edematous as far as could be seen. This condition gradually improved until at the end of eight weeks the patient had recovered from the distressing symptoms,

leaving a very sensitive respiratory tract with a persistent cough and hoarseness.

WOUNDS OF THE THROAT INVOLVING THE PHARYNX
AND LARYNX.

These were exceedingly rare in the hospital centers at some distance from the line of battle, as most of the cases of this nature were classed as urgent and sent to hospitals situated in the immediate vicinity of where the injury was received. The actual number of cases in comparison to other injuries was small, due to the protection which the chin offered, and, in the event of being wounded, to the fatalities from injuries to the great vessels in the neck.

PHARYNX.

These were rare, but occasionally when a missile of low penetrating power entered the neck and happened to avoid the great vessels, it either wounded or found lodgment in the pharynx. When this occurred from a high explosive shell or shrapnel the injury was more or less extensive and correspondingly dangerous, due to the certainty of infection and to the probable extension to vital structures. Machine gun bullets, on the contrary, could cause a penetrating wound of the neck traversing the pharynx, followed by prompt healing and little discomfort to the patient. It was really astonishing the slight inconvenience that some of these through and through wounds of the neck caused, especially when their location was taken into consideration.

LARYNX.

Wounds involving the internal structure of the larynx were seldom seen, due in a large measure to the natural protection afforded by the chin, as well as the mobility of the larynx itself; moreover, it must be remembered such injuries, when received, were rarely confined to the larynx but frequently embraced the great vessels of the neck in their destructiveness with almost immediate fatal consequences. Such wounds if received from the front were apparently most frequently due to high explosives, while those from the side, shrapnel and machine gun and rifle fire. By far the most frequent appear-

ing at the hospital were caused by machine gun bullets. The relative infrequency of any sort of wound involving the larynx can be judged by the reports of Guisez, who found 17 in 726, and Scheier 7 in 2,500.

Symptoms.—One of the earliest and most common symptoms of a throat wound involving the larynx is dyspnea. This is due to a number of causes, including (a) the missile acting as an obstructing foreign body; (b) obstruction from the injured structures; (c) paralysis of the laryngeal muscles, and (d) the appearance of edema. Hemorrhage is constant and frequently serious in character, due of course to the rich blood supply of the larynx and the numerous and important vessels in its immediate vicinity.

Treatment.—Almost every case of this character, sooner or later, required a tracheotomy. Indeed many more patients would undoubtedly have been saved had an early tracheotomy been performed. Should dyspnea not occur immediately after reception of the injury, the possibility of its appearing later is by no means precluded, and should be confidently anticipated. The swelling and edema played the most important rôle in this connection, and the patient should be closely watched on this account. Immediate and secondary hemorrhage caused serious concern on account of its peculiar fatality. In many instances, the cartilaginous portions of the larynx were so shattered that it was difficult to find the bleeding points; these were the type of cases in which secondary hemorrhage so often occurred.

After the first phase of the treatment is completed—that is, when danger to life has passed and it is assured that the patient will survive, the attention should be directed to the conservation of the laryngeal tissues. The objects of this are to prevent subsequent stenosis, to preserve as much of the voice as possible and for cosmetic effects. This is accomplished by plastic resections and is largely in the province of general surgery.

NONSURGICAL AFFECTIONS OF THE PHARYNX AND LARYNX PECULIAR TO WAR CONDITIONS.

Excluding those conditions produced by the irritating gases (chlorin, mustard and sneezing), it cannot be properly said

that any conditions peculiarly incident to war conditions were observed. The various commoner affections, such as coryza, sore throat, etc., were present as in civil life, but as the men became inured to life in the open they were much less frequently met with. There is no question that the men complained much less of nose and throat conditions than they did in the camps and cantonments in the States. The care and attention that these men received at home from the specialists before they were sent abroad was, without a doubt, responsible for this happy state of affairs, and I am proud to state that the results of the throat surgery practiced upon these men were almost unexceptionally without reproach.

THE EPIDEMIC OF INFLUENZA IN RELATION TO THE NOSE
AND THROAT.

Everyone recalls the marked predilection for the respiratory tract shown by the causative factor of the influenza during the late epidemic and with what intensity and rapidity the pulmonary structures were involved. One would naturally suppose that the upper respiratory tract, particularly the nasal sinuses, would be shared in the involvement, at least in a more or less attenuated form. Previous epidemics have always been followed by a certain amount of sinus disease, therefore, everyone was on the lookout for the first symptom of this complication, and being particularly interested I was especially alert. I can now state that among the many hundred cases which I personally saw, not one gave the slightest symptom pointing towards the nasal sinuses. On inquiry among the other hospitals I found the same condition prevailing.

Acute angina was also the exception rather than the rule, even among those who contracted pneumonia. The larynx and trachea were not involved in the ordinary cases and seldom among the pneumonics. This was substantiated not only by laryngoscopic examinations but in the cases that ended fatally by autopsy.

As a résumé, it can be said that the great epidemic of influenza, at least in Southern France, showed very little predilection for the mucosa of the upper respiratory tract.

XXXIX.

MILITARY SERVICE*

OF

MAJOR HENRY LEWIS WAGNER, M. C., U. S. A.,

SAN FRANCISCO.

December 22, 1909, commissioned First Lieutenant, M. R. C., U. S. A.; inactive list.

June, 1916, Student Training Camp for Medical Reserve Officers at Fort Winfield Scott.

July 1, 1916, transferred to active service, First Lieutenant, M. R. C., U. S. A. Duty assigned: Chief of the Eye, Ear, Nose and Throat Service at the Letterman General Hospital, Presidio, San Francisco, from July, 1916, until December, 1918.

Promotion: Major, M. R. C., U. S. A., July, 1917.

Subsequent assignment to duty September 26, 1918. Commanding Officer Letterman General Hospital, Presidio, San Francisco.

Honorably discharged, December 5, 1918.

Medical report of the Nose and Throat Department Letterman General Hospital, Presidio, San Francisco, from July, 1916, until December, 1918:

Peritonsillar abscess, in large numbers quickly eradicated under local anesthesia, by usual incision with counter opening into supratonsillar space for proper drainage.

Tonsillectomies and adenectomies, in large numbers, under local anesthesia, with additional pituitrin. Small children under gas and ether. Few severe hemorrhages but no deaths. Preliminary blood and urine analysis if deemed necessary.

Bacillus fusiform with Vincent's spirochete, infection in mouth and throat in fairly large numbers, were comparatively quickly eradicated by curettement and application of tincture of iodine and general treatment.

*Symposium on Military Service of the members of the American Laryngological Association.

Arthritis of larynx, especially of cricoarytenoid joint, in a few older enlisted men, verified by repeated radiograms, did not offer any favorable prognosis.

Tongue lesions, excoriations and fissures due to sprue were only symptomatically benefited by lanolin and vaselin applications.

Calculi in submaxillary duct in several men with long Philippine service, simulating gastric and duodenal disturbances, were entirely relieved by the Wharton duct operation.

Chlorine gas poisoning cases, accidentally during time of training, producing edematous hyperemia in upper and lower respiratory tract, did well under chlorid of calcium internally and adrenalin locally applied.

Nasal leprosy, ulcerations in a civil employee from Alaska, showing pure culture of leprosy bacilli, transferred to leper colony.

Congenital nasal syphilis, in infants of enlisted men, stadium siccum and stadium secretionis, were most successfully treated by rectal hydrargyrum suppositories.

Operated sinus cases, after measles and scarlet fever, improved more readily under chlorid of calcium treatment.

Fracture of anterior frontal sinus wall and nasal bridge in aviator was corrected by intranasal operation.

Mosher's operation for draining lacrimal sac and nasal duct into the unciform fossa was found most practicable in comparison with other methods.

Convalescent cerebrospinal meningitis cases, showing labyrinth or retinal or optic nerve disturbances, manifested concomitant symptoms in the olfactory nerve tract.

Malingering among nose and throat patients was rarely observed. Instruction in personal nose and throat hygiene was given to all patients.

Daily sanitary inspection of our department wards, clinics and operating room produced a high degree of efficiency in our personnel.

XL

MILITARY SERVICE*

OF

MAJOR GEORGE B. WOOD, M. C., U. S. A.,

PHILADELPHIA.

My experience as an army otolaryngologist was attained entirely at Camp Meade. I reported for active service there on November 1, 1917, and there I stayed until my discharge on December 17, 1918. I was assigned for duty in connection with the Base Hospital, but was asked to be one of the board of special examiners and had charge of the examination of the ear, nose and throat of recruits. This latter work was done in the camp. The greater part of my duties, however, was connected with the Base Hospital.

At first there was absolutely no equipment, as when I arrived there the Base Hospital was far from completed, and only the framework of the building for surgery of the head started. In the latter days we had very excellent equipment in the ear, nose and throat clinic, in the operating room, and in the accommodations for ward patients.

The greater majority of the otolaryngologic staff were very excellent men. Almost all of them trained specialists and happily pleasant companions. Most of the staff who were there in the winter of 1918 were transferred to Base Hospital units for overseas duty, and at times the personnel became very much reduced. The proximity of the camp to Washington, however, may have been partly responsible for the comparatively short time when the nose, throat and ear work was handicapped by a lack of men, and towards the last we really had more men on the staff than we could keep busy.

We had a large outpatient dispensary which in the busy season required the services of two men for the greater part of the day. We had from one to three wards filled with nose, throat and ear cases, and the consultation work throughout the hospital kept one man pretty well occupied.

The operative work consisted chiefly of removing tonsils, submucous resections and mastoid operations. We did very little sinus work for chronic conditions, as it seemed to us much better to discharge a man with frank chronic sinusitis than to attempt any radical curative treatment. This applied also to the cases of chronic suppurative otitis media; only four or five radical operations being done during the time that I was there, and these mostly because of acute complications. After the spring of 1918 the commanding officer ruled that none except absolutely necessary operations should be done. This cut out the greater part of our tonsil and septum work during the summer and fall of 1918. Minor operations, such as paracentesis of the ear drum, opening peritonsillar abscesses and incising furuncles of the external auditory canal were, of course, very numerous, especially during the winter months.

Most of our tonsil operations were done under ether; dissection and snare being the usual method of operating. The Sluder method was used for a while, but we had so much difficulty in controlling hemorrhages following this procedure that the method was given up.

We had considerable difficulty with acute tonsillitis following submucous resections, and occasionally other operations on the nose. Some investigation was carried out to determine, if possible, the cause of the frequency of tonsillitis in these cases. It was found that the presence of the hemolytic streptococci or other organism of an individual to be operated on, if said individual was in good health, had no effect upon the postoperative infection. On the other hand, if the patient soon after the operation came in contact with another patient suffering from acute tonsillitis or other acute infection, especially if the hemolytic streptococcus was present, tonsillitis developed in other 50 per cent of the cases, the disease beginning either on the fourth or fifth day after the operation. We were not bothered by any other type of postoperative infections.

Mastoiditis requiring operative interference was much more in evidence during the epidemics of acute infectious disease, especially measles. Our scarlet fever epidemics at Meade

showed a very mild type. As a rule, our mastoid cases did very well, though in a few, secondary curettements or closures were necessary.

The terrible epidemic of influenza was characterized, as far as Camp Meade was concerned, by comparatively few complications of the ear, nose and throat. We had some 11,000 cases of influenza at Camp Meade, and out of this whole number only five developed mastoid infection sufficiently severe to demand operative interference.

There was a fairly large number of cases of slight otitis media; the majority recovered without even paracentesis. In the cases of otitis media which were sufficiently severe to call for opening of the drum there were usually hemorrhage blebs, both in the wall of the canal and on the drum. We did not see these peculiar subepithelial hematomas except during the influenza epidemic.

Epistaxis was very frequent in the influenza cases, so much so that the large majority of cases were not seen by a specialist; in fact, in only the severe cases were consultations asked for.

Sinusitis was fairly frequent, but usually recovered spontaneously in a day or so, though in one case in which orbital abscess was threatened, anterior ethmoidectomy was done. Laryngotrachitis was very common, though permanent destructive changes of the larynx were not seen. When the tracheal inflammation was severe, it was usually several weeks before the cough would clear up.

On the whole, the otolaryngologic work was interesting and instructive, though it was difficult at times to keep a smooth working organization because of the constant changes in the personnel, not only of the subordinate positions but also of the heads of departments. As a mild criticism, I personally believe that the various branches of medicine making up the surgery of the head unit should have been separate departments, and the head of each of these separate departments responsible directly to the Surgeon-in-Chief and not to an interposed head of Surgery of the Head.

XLI.

MILITARY SERVICE*

OF

CAPTAIN J. GORDON WILSON, C. A., M. C.,

CHICAGO.

I went to England in August, 1916, and was assigned on temporary duty to the Eye and Ear Hospital in Folkstone, established by the Canadian Army Medical Corps, in charge of war injuries to the labyrinth. In December, 1916, I was sent to France to report on injuries to the ear from high explosive shells.

My report, abbreviated, was published in the *British Medical Journal*, March and April, 1917 (later expanded into papers printed in the *Transactions of the American Otological Society* and the *Harvey Lectures* of New York, 1917).

When America declared war, I returned to Chicago and from that time on served on the Medical Advisory Board.

*Symposium on Military Service of the members of the American Laryngological Association.

ABSTRACTS FROM CURRENT LITERATURE.

I.—EAR.

The Granular Substances in the Cells of the Organ of Corti of the Guinea Pig.

NAKAMURA, N.

Kioto University Bulletin of Otolaryngol., 1918—XII.

The writer has found, in his experimental works on the labyrinth of guinea pigs, stained by the Marchi's method, many small black granular masses in the cells of the organ of Corti, and drew the following conclusion:

1. In the organ of Corti in the guinea pig, when treated by the Marchi's method after decalcification and before putting into alcohol, many small black spherical granules in certain places in the cells of the organ of Corti are recognized in addition to the well known fat granules in Hensen's cells.

2. These granular bodies have been found especially rich in the upper part of the hair cells, but there are also some in the rods and Deiter's cells.

3. If the labyrinth is well fixed in life, the granules do not appear, and it may be concluded, therefore, that they must be the result of some postmortem changes.

4. The bodies can only be found by the Marchi's method, and even then, if the material is too large, the stain will not penetrate the granules. When the fat granules in Hensen's cells are poorly stained, the granules in the upper part of the hair cells are not stained at all. They are not stained with the usual stains.

5. The presence of this granular substance is not influenced by the pathologic or normal condition of the cells; and hence may not have any physiologic significance.

T. Hoshino.

II.—NOSE.

The Anaphylaxis Produced by the Absorption of Foreign Proteins from the Nasal Cavity or from the External Auditory Meatus.

ISHIDA, N.

Kyoto Univ. Bulletin of Otolaryngol., 1918—XII.

The author quotes detailed reports on anaphylaxis, and studies the possibility of producing anaphylaxis from the nasal mucous membrane or external auditory meatus. Up to the present time it is supposed that it may be produced, but there has been no definite proof concerning this.

To solve this question he uses, as the anaphylactogen, goat serum, egg albumen and bacterial protein. These he introduces in the nasal cavity or external auditory meatus of guinea pigs, during certain intervals of time.

He concludes with the following:

1. When an anaphylactogen is introduced into the nasal cavity or into the external auditory meatus, there results an anaphylactic reaction after a certain time. When the anaphylaxis is produced, through the external auditory meatus, however, the reaction is not so marked.

2. When goat serum is introduced in the nasal cavity, every day for three days there follows a slight anaphylaxis, but when introduced every day for four or five days there occurs a stronger anaphylaxis. If the serum is introduced four times in one day slight anaphylaxis is observed, while if it is applied five to six times in one day a strong reaction appears.

3. With the introduction of goat serum into the external auditory meatus, every 24 hours for five days there is again observed a slight anaphylaxis. If it is continued five to six days there occurs merely a more pronounced reaction.

Likewise, in introducing it into the external auditory meatus five to seven times in one day, a slight anaphylaxis will again follow, while if it is introduced eight or nine times in one day strong anaphylaxis will be noticed.

4. When goat serum was introduced into the nasal cavity of a guinea pig every day for four days, a slight anaphylaxis resulted after five or six days from the last application, while after seven days the reaction is still stronger.

If the nasal cavity is treated with goat serum five times in one day there occurs a slight anaphylaxis after six or seven days from the last introduction; and then a stronger reaction after eight days.

5. If goat serum is put into the external auditory meatus once every day for six days a slight anaphylaxis follows after seven or eight days from the time of the last treatment; but a somewhat stronger reaction follows after nine days.

If it is introduced eight times in one day, a slight anaphylaxis follows after eight or nine days; but a somewhat stronger reaction follows after ten days.

6. When a mixture composed of bacterial protein 1 volume, leucocyte emulsion 1 volume, and extract of leucocytes 1 volume, is introduced into the nasal cavity no anaphylaxis follows. If a mixture composed of bacterial protein and extract of leucocyte is introduced, however, a weak anaphylaxis is sometimes observed.

7. When the same mixture is introduced as an anaphylactogen into the external auditory meatus, no anaphylactic reaction follows. If a mixture composed of bacterial protein and extract of leucocyte is introduced, however, a slight anaphylaxis is sometimes observed.

T. Hoshino.

Treatment of Malignant Tumors of the Antrum.

NEW, G. B.

J. Am. M. Ass., Chicago, LXXVII—1296, 1300.

The usual treatment of malignant tumors of the antrum has been the resection of the upper jaw. The results have been operative mortality, very frequent early recurrences, and a small percentage of cures. By the use of the cautery and radium in the treatment of these conditions, two advances have been accomplished: First, the elimination of an operative mortality, and second, a marked decrease in the percentage of cases showing recurrences. The number of cures in the treatment of these patients by this method cannot yet be determined, but the present results are very encouraging. The cautery has been employed in the treatment of malignant tumors for many years. At the Mayo Clinic for the last three years malignant tumors of the antrum have been treated by the use

of heat in the form of a soldering iron followed by radium treatment, and the immediate results are much better than when resection of the jaw was performed.

These have been followed by no operative mortality and no postoperative chest complications. Two of the patients lost the eye on the side involved from the reaction from the cautery and radium, but in both cases the floor of the antrum was involved. Of the eighteen patients with malignant tumors of the antrum who were treated, three are dead, two have extensive recurrences, and ten are well and have had no recurrences over a period of from eight to twenty-eight months. In seven of these ten cases there have been no recurrences after more than one year. In three cases data regarding the present condition of the patient were not obtained. The ten patients who are well cannot yet be considered cured, but their cases should be classified as having been without recurrences for a period of months or years. The results of the treatment of malignant tumors of the antrum, by the use of the cautery and radium, seem to indicate that the operative mortality that usually accompanies the surgical treatment of these conditions has been eliminated, and the immediate results have been improved markedly.

Emil Mayer.

Focal Infections of the Head as Sources of Systemic Diseases.

KING, JAMES JOSEPH.

Med. Rec., N. Y., 1920—XCVII—355.

Conclusions:

1. During the last ten years over fifty writers have presented scientific proof of the relationship of focal infections to systemic disease. This, in addition to the voluminous clinical evidence, has established beyond a reasonable doubt the etiologic relation of primary foci of infection to systemic disease.

2. In order to cure patients, the primary focus or foci must be found and eradicated, practically ignoring which one is the instigator. With our broader conception, we endeavor to look over the whole body and correct what is obviously pathologic. A certain amount of enthusiasm and generalship in the co-operation of different specialists is essential. The focus is

dealt with according to its location, by methods well known to all of us.

3. The new developments in this field are: (a) The broad application of this principle, now accepted by all progressive medical men. (b) The proof of stomach and intestines becoming infected by deglutitions of infected secretions from tonsils, sinuses and teeth. (c) The relation of primary foci in the tonsils to the mortality rate in such acute infections as measles, scarlet fever, pneumonia and influenza. (d) Its field of application is unlimited. We are just beginning to appreciate its value.

Emil Mayer.

**An Improvement of the Incision of the Lateral Nasal Wall in the
Radical Operation for Chronic Maxillary Sinusitis.**

KOIDE, G.

Kioto Univ. Bulletin of Otolaryngol., 1918—XII.

The writer reports an improved modification of Watsuji's operation. Prof. Watsuji independently designed a similar radical operation in maxillary sinusitis (May, 1905. Tokio Iji Shinshi) to the one Denker published in the same year. The writer first quotes the history of the operations in this affection and then shortly reviews Watsuji's operation.

In Watsuji's operation an incision about 3 cm. long is made in the labial mucous membrane just lateral to the frenulum in a transverse direction parallel to the line of attachment of the mucous membrane to the alveolar process. After denuding the mucoperiosteum, the anterior wall of the sinus is exposed. Then the mucoperiosteum of the lateral wall of the nasal cavity, from the edge of the apertura piriformis in the space between the line of attachment of the inferior conchæ and the floor of the inferior nasal meatus, is denuded.

The bone of the anterior wall of the sinus is removed, beginning from the edge of the apertura piriformis to the extent of 1 to 1.5 cm. This window gives an inside view of the sinus, and next the lateral nasal bone wall is removed to a depth of 1 cm. and 3.5 to 4 cm. anteroposteriorly on the average Japanese adult. Care is always taken so that the lower edge of the bone is on the same level with the floor of the inferior meatus. The previously denuded mucoperiosteum of

the lateral nasal wall is excised in a long quadrangular piece corresponding to the opening in the bone. The lining of the sinus is then curetted thoroughly and the cavity packed with iodoform gauze. The lip is then sutured and the operation is finished.

The difference between this and Denker's operation is chiefly in two points: First, it diminishes the facial opening, which has the advantage of lessening the degree of the anesthesia of the teeth after operation; and second, it does not interfere with or even touch the inferior turbinate, which is physiologically of importance.

The writer's method is to make the fenestra in the anterior wall first, but when he chisels away the lateral nasal wall he makes the upper edge of bone correspond exactly to the line of attachment of the inferior turbinate. When he has gone backward on this line for 3.5 to 4 cm., he cuts the bone away down to the level of the floor of the inferior meatus. This operation gives the same opening in the anterior wall at the edge of the apertura piriformis as is done in the Watsuji's method, but the quadrangular fenestra has an irregular upper edge, the maximum height being 2 to 2.5 cm., while at the posterior edge the opening is 1 to 1.5 cm. This increased width of opening aids in preventing the closure from granulation tissue after operation. T. Hoshino.

III.—PHARYNX AND MOUTH.

Tetany in the Case of Sprue.

BARUCH, A. L., AND MURRAY, H. A.

J. Am. M. Ass., Chicago, 1920—LXXIV—787.

A diminished concentration of calcium in the blood has been shown to produce tetany, and in the case under discussion the lack of this element was demonstrated by analysis of the blood. As bearing on the question of the cause of the disturbance of calcium metabolism in this particular individual, the following points are emphasized:

According to von Noorden, calcium is absorbed in the upper part of the intestine, combined with phosphoric and carbonic acids, but more especially with fatty acids in the form of soaps. Sprue patients, however, and many stool examinations

proved it in this case, cannot readily digest fats. Is it not conceivable, then, that calcium was carried on with the fats, and that its absorption through the diseased intestinal mucosa was insufficient to maintain the proper balance? This is mentioned as a possible predisposing factor.

Calcium is mostly excreted into the large bowel; and in the present instance, owing to the prolonged intestinal irritation lasting over six or more years, the excretory rate of the substance by this outlet may have been abnormally increased. Such abnormal elimination would have tended to disturb still further the calcium equilibrium.

That the condition of the blood was an important factor is suggested by the rise in calcium following the transfusion of normal blood. We consider some of these points suggestive, but not conclusive enough to form any hypothesis for explaining the course of events which led up to the state of tetany.

Emil Mayer.

Clinical Indications for Enucleation of the Faucial Tonsil.

QUACKENBOS, MAXWELL.

Med. Rec., N. Y., 1920—XCVII—654.

The absolute indication for enucleation of the tonsil may be defined regionally. There are four local conditions that indicate enucleation: (1) New growth, (2) the tonsillotomy operation, (3) recurring acute inflammation, (4) hypertrophy associated with eustachian or nasal obstruction. To these may be added the persistent diphtheria carrier.

Three reflex conditions warrant enucleation, particularly if upon inspection faucial hypertrophy is present: (1) Cough due to an enlarged lingual tag, (2) nocturnal enuresis in the absence of acid concentrated urine, (3) petit mal, or meningism.

The dangers and complications are slight. Two children developed bronchopneumonia, and two with chronic discharging ears required a mastoid operation a few days later. Five adults developed unilateral acute otitis media, and in three of them incision of the drum was required.

There were two deaths. One unfortunately from an overdose of chloroform (!); the other patient was operated upon for acute mastoiditis superimposed upon chronic otorrhea of

many years' duration, and upon the third day showed intracranial pressure symptoms, without localizing signs; postmortem examination revealed a cerebellar abscess.

Emil Mayer.

The Cause of Abscess of the Lung After Tonsillectomy.

CLENDENING, LOGAN.

J. Am. Med. Ass., Chicago—LXXIV—942.

1. Lung abscess is at present a frequent sequel to tonsillectomy.
2. It occurs in all classes of cases—in private as well as in free services.
3. It is sometimes fatal, always serious and often very crippling.
4. It is due in some cases to inspiration of infected material.
5. Motor driven anesthesia apparatus, by creating a positive pressure in the pharynx, may operate as a cause. At any rate, the danger is sufficiently great to justify the discontinuance of their employment until comparative data can be secured.
6. It is due in some instances to metastatic infection through the lymphatics.
7. Swabbing or tampering with the throat after enucleation has been accomplished is the cause of one group of cases.

Emil Mayer.

IV.—LARYNX, TRACHEA AND ESOPHAGUS.

Laryngeal Crisis With an Unusual Complication.

GREGORY, LOUIS T.

J. Am. Med. Ass., Chicago, 1920—LXXIV—793.

The case reported was apparently a syphilitic laryngeal paresis, corresponding to a gastric crisis, so frequently seen. It might have been an unusual type of diphtheritic paresis, but this is not likely, as there was no history of any diphtheritic process and no local evidence of diphtheria in an active form. Furthermore, it was a paresis, transient in type, and not a paralysis, as usually seen following diphtheria. Finally, the Wassermann reaction was strongly positive, with other evidence of syphilis as seen in the sluggish pupil, perforated sep-

tum, scars on the back and chest, and painful and roughened tibia, with a history of chronic sore throat and nocturnal pains in the lower extremities. The immediate response to anti-syphilitic treatment confirms the diagnosis. As the left recurrent laryngeal nerve hooks around the arch of the aorta, one interesting possible explanation of the paroxysm is that a beginning syphilitic aortitis at this point caused an irritation to that nerve.

Emil Mayer.

V.—MISCELLANEOUS.

Acute Respiratory Disease Carriers.

SPOONER, LESLEY H.

J. Am. Med. Ass., Chicago, 1920—LXXIV—584.

Conclusions:

1. The chronic healthy diphtheria carrier is very rare.
2. Although the sterilization of his mucous membrane is difficult, it is easier than that of the chronic disease carrier.
3. He and his fellow, suffering from the early stages of acute infection, are the potent factors in the spread of this disease.

Acute respiratory disease is at present the greatest menace to the youth of our country.

It is more serious in the army than in civil life.

The transient healthy carrier is more common than should be expected from the incidence of the specific disease.

The transient quality is shown by the disappearance of the organism without treatment.

The chronic healthy carrier is rare, except in the case of the "saprophytic pneumococcus" of Cole, in which many of the organisms may be nonpathogenic, and with streptococcus hemolyticus, in which a similar condition may well exist.

The potent factors in the spread of these diseases rest in this small group of chronic healthy carriers and the disease carrier.

The latter, during the prodromal stages of disease and convalescence, is of by far the greatest importance.

They respond to attempts at disinfection even less satisfactorily than do the chronic healthy carriers.

Emil Mayer.

SOCIETY PROCEEDINGS.

THE NEW YORK OTOLOGICAL SOCIETY.

Meeting of May 27, 1919.

DR. T. J. HARRIS, PRESIDING.

Atypical Mastoiditis.

DR. W. C. PHILLIPS: I want to speak in a general way of the prevalence during the past season of what we ordinarily call atypical cases of mastoiditis, in which there are but few classical mastoid symptoms. Many of them have little or no discharge; little or no pain; little or no temperature; but finally the few symptoms verified by the radiograph lead one to operate and very extensive involvement is found in the mastoid process.

I recall a private case in consultation with Dr. Friesner, which eventually required a double mastoid and in which extensive disease was found.

Another case somewhat different was a woman forty years of age, who complained of no pain in the ear, very little discharge, no mastoid symptoms, but enough redness of the drum and bulging apparent to lead me to believe that it was not a case of catarrhal involvement. I opened the ear drum, and she had some discharge for two or three days, but always complained of a sense of fullness on the side of the head. The discharge entirely ceased, and for about a period of over a week there was no discharge. She went back to her work and was apparently well, when suddenly she had a little bit more pain, and then a very profuse discharge of pus, and some temperature, but no tenderness of the mastoid. The discharge remained excessive, she had gone over a period of three weeks, and she was running a temperature of about 100 in the afternoon. I operated on her last week, and I have never seen a more extensively involved mastoid process. And yet that

woman never had any pain; she never had a temperature above 100, and for the first three weeks of her disease, some of the time no discharge, and almost none until the last few days.

DR. A. B. DUEL: As far as my two interesting cases go, one was a double mastoid and the other a single mastoid, with a very slight middle ear involvement. In one case I myself was called in, and in the other case another physician was called in, and in neither was there sufficient involvement of the ear to warrant opening of the drum. There was a slight redness, and a slight pain, which subsided immediately; and after three or four days, another attack of pain, and at that time an involvement of the middle ear. In all of those ears the symptoms advanced so rapidly, and the discharge was so profuse following the opening of the middle ear that it seemed a wise thing to open the mastoid.

In all three of those mastoids the involvement was just as extensive as in Dr. Phillips' cases. In one, both sinuses were uncovered. Now, it seemed impossible for me to account for this condition, except by the idea that the infection had passed across the middle ear without very serious involvement, and involved the mastoid cells; that the inflammation had gone on there for a number of days—in one case for a week or so, from the very beginning—and that after the mastoid had become completely involved, it passed back into the middle ear, and passed out of the drum and had to be opened. Of course, it seemed absolutely impossible that such an extensive involvement could possibly have happened in a very short time following the acute middle ear symptoms.

CHAIRMAN: What was the organism in your case?

DR. DUEL: It was streptococcus.

DR. S. McCULLAGH: I saw this young man about three weeks to a month after he had had an acute infection of his left ear for which a myringotomy was performed in an army hospital. There was a discharge for two or three days, and complete healing ensued. He came to see me for an acute catarrhal condition of his right ear, which cleared up under local treatment. He had very large tonsils, and a mass of adenoids, which I removed.

About nine days after the operation he had an acute suppurative attack in his left ear, for which I did a paracentesis.

The temperature at that time had been up to about 103; it went up to 105 $\frac{2}{5}$. Blood culture showed that the blood was swarming, literally swarming, with hemolytic streptococci. The ear was draining very well, and there were no symptoms, nothing in the ear picture that did not seem to be progressing favorably. There was no tenderness, no spontaneous pain, but the temperature was irregular. Dr. Friesner saw the case with me, and it was a question of whether the septicemia was secondary to the tonsillar operation.

The tonsillar cavity on the left side did not look well, and there seemed to be a slight amount of tenderness over the left jugular, with some involvement of the glands there. The boy was very sick, and it was decided that something must be done immediately. I think Dr. Friesner felt that the bacteremia was undoubtedly secondary to the tonsil operation as did I. I did not think that it could come from the ear, but at the operation I decided to go in through the mastoid on that side. This was six to seven weeks after his original infection. On opening the mastoid all the cells were full of granulation tissue. In the region of the bulb the inner plate was entirely destroyed, and there was an area about half an inch in diameter with a thick pad of granulation tissue on it. The sinus was plugged off, the jugular was tied and a portion of it resected. The sinus was opened, the wall of the sinus was not removed, the wound packed and the patient was put back to bed.

Inside of forty-eight hours his temperature reached normal, and continued normal and his recovery has been uninterrupted.

It was merely because of the slightly greater amount of tenderness over the left side, and the enlargement of the glands that made us go in on the left side originally.

Undoubtedly, this condition corresponds closely to the one that Dr. Duel referred to, in which there had been infection involving the mastoid, where the middle ear cleared up, and the destructive process had continued in the mastoid without any symptoms whatever. I had looked, of course, at his left ear when he came in complaining of his right ear, and the drum was practically normal at that time.

DR. I. FRIESNER: Surely atypical cases of mastoiditis have been more common this year than I have ever seen them before. I saw, during the months of January and February, four cases of perisinus abscess, in which there never had been any discharge from the middle ear. These cases began as very mild cases of otitis. No myringotomy was done, and the cases went on; all four of them had pain over the side of the head, and when I examined them the drums were not normal. They were thick, and in one or two of them there was distinct sinking of the posterosuperior wall.

There were three other cases that I saw during that time, or shortly after that time in the clinic, with precisely similar conditions; that is, there never had been any discharge from the middle ear; there had been an acute otitis of a mild character, followed by an intense hemicrania. After a little while they came to the clinic complaining of this pain over the side of the head, giving the history of a mild, acute otitis, four, six or eight weeks before; the tenderness was far back on the mastoid, in the region of the emissary, and the drum looked thick.

It seems to me that there must have been something peculiar about the infections this year if in an operative service as limited as mine I should have seen seven of those cases within so short a time.

As to Dr. McCullagh's case, I thought that the pyemia was a direct extension into the jugular from the pharyngeal veins, and we felt we had only one chance—that was to say, we must select into which vein this infection was entering. There was some difference in the two sides; the left side was brawny, somewhat brawny, and the glands were more numerous on that side than those on the right side. It was rather a surprise to me to see the findings in the mastoid. There was no pus, but the mucosa in the cells was very much swollen, and the horizontal portion of the sinus was covered with diseased bone; and on the dura, that is, on the outer covering of the sinus, there was a distinct diseased patch. The vein in the neck was perfectly normal. In other words, there were far more pathologic changes in the lateral sinus than there were in the jugular.

DR. W. C. PHILLIPS: I think this type of case calls for fine judgment. Yet every case has proven the diagnosis to be right.

DR. WELLS P. EAGLETON presented

A Case of Laryngitis With Unusual History and Most Unusual Pathologic Findings.

DR. WELLS P. EAGLETON: Almost all of us think that all this talk about tonsils and cleaning the teeth, etc., is a good deal of nonsense, but the postmortem presented made me believe that we can't avoid recognizing that if you are careful to look for chronic infections it can cause changes. And it is our business, if we see a diseased tonsil or bad teeth, to recommend their removal immediately.

Now, in this case, the thing that had made this man stay off was that he had always had headaches, never anything worse. But, in reality, he had a chronic infection that was producing a fibrosis in the vessels of his brain. It could have been prevented, if he had been operated on for some fibrosis infection perhaps thirty years before.

Also, another thing is the importance of infection on weak conditions. While I was down in Baltimore, talking to Weed, he told me a remarkable thing. They had found that by taking an animal and injecting it with Friedlander's bacillus they gave it septicopyemia. If they did a lumbar puncture the spinal fluid was clear, but by doing the lumbar puncture they gave it a meningitis. They repeated it over and over again, and in Weed's mind there is no doubt that in certain forms of septicopyemia, if they give him a lumbar puncture, they will give him a meningitis.

The first time the test is clear, but the second time it shows an infection of meningitis. Now, one who is subject to a chronic poison is more apt to have a secondary meningitis. Why should this man suddenly have flared up if he hadn't it? In other words, he would have gotten away with the disease if he hadn't had this chronic infection.

DR. J. R. PAGE asked Dr. Eagleton if the spinal fluid was very straw colored in intracranial complications. He happened to have seen it in a case of a brain abscess, in which

the spinal fluid was like urine. No bacteria could be found on smear or culture.

DR. F. J. BLODGETT: My case is a young lady, 21 years old, who has measles. The third day of the measles her right ear pained her and I incised it. There were no signs of inflammation in the left ear. That was at two o'clock in the afternoon. At nine o'clock the same evening she had pain in the left ear and I incised it the next morning. Her temperature went along well for a day or so, and then it went up to 102, with the onset of bronchitis. It was only a mild sort of bronchitis, and yet the temperature was running from 102 to 103 right along. At the present time, eight days after the attack, general condition is good, temperature 102 to 103, no headache, and yet I am in fear of the development of some serious complication.

DR. I. FRIESNER: I was very much interested in the work that was done in Baltimore. I have tried to correlate that work with some of our clinical findings, and it occurred to me that all of us have seen repeatedly atypical cases of sinus thrombosis in which there has been, for instance, a sustained high temperature with headache, where we were in doubt as to whether we were dealing with a meningitis or not, and where simultaneously we had a blood culture, blood count and a lumbar puncture done. Now, I am sure that not one of you will recall a case in which, despite the fact that a positive blood culture was found, meningitis ensued because of a lumbar puncture.

The work in Baltimore is very interesting. It was done on monkeys, wasn't it?

DR. EAGLETON: No, on a cat.

DR. FRIESNER: Cats are exceedingly prone to meningitis. Clinically, the fact that following lumbar puncture in the presence of a positive blood culture with sinus thrombosis, meningitis has never followed, so far as I know, leads me to doubt very much the value of this work so far as it applies to otology.

I would like to hear from Dr. Eagleton about that, because I feel sure that idea must have occurred to him, too.

DR. EAGLETON: I agree with all Dr. Friesner says. That has been my personal experience, but we have seen sinus

thrombosis, when we did lumbar puncture, that did not develop into meningitis, but then we have seen sinus thrombosis cases, with the Friedlander infection, that did develop into meningitis. While they were doing this work, and after they had already prepared it, a man from one of the camps reported that he had made the same observation in the camp, not among cats, but among humans, and he said that it depends on the infection. If there is an epidemic of Friedlander's bacillus, as far as it is known now, a lumbar puncture results in meningitis. It is not so in the streptococcus septicemia.

DR. A. B. DUEL: It strikes me that Dr. Blodgett's case is a problem. It is a very fortunate thing when such a case happens to be in the institution where the X-rays may be used. If Dr. Blodgett had an X-ray apparatus right next to his patient, he could have a confirmatory report on his suspicions. But I can see perfectly well where a man might hesitate to operate on a case for a few days, without any further symptoms than he has.

DR. W. C. PHILLIPS: As I recall it, Dr. Blodgett stated that there was distinct mastoid tenderness at the tip.

DR. ROBERT LEWIS: I would be inclined to operate.

DR. PHILLIPS: I would venture to predict that any time within the last few days it would have shown disease of the mastoid.

THE CHAIRMAN: The Chair would like to ask if any of the gentlemen have had any experience outside of institutions on the X-ray outfit? I studied it pretty carefully at Oglethorpe. At first we were satisfied with it, but after a while we came to the conclusion that the pictures were misleading and we were not willing to venture an opinion on it.

DR. PHILLIPS: I think we all recognize that radiographs of the sinuses and the mastoid are good ones only when made by experts. I don't know, even in New York City, outside of three places where I could ever expect a good radiographic picture.

THE CHAIRMAN: I am speaking of the portable—

DR. PHILLIPS: I understand, but I doubt if any portable apparatus has been perfected.

DR. ROBERT LEWIS: I saw a case four days ago that has developed some alarming features. He had had a maxillary sin-

usitis a month or so past, and later developed an acute purulent otitis media. The drum membrane was opened three weeks ago. A week or ten days later the perforation was healed. There was no discharge. There was some slight deafness present. Two days before I saw him there developed a swelling underneath the tip of the mastoid process.

I was asked to see the patient and I found that the drum membrane was somewhat thickened. There was a little pink condition around Shrapnell's membrane; he had no mastoid tenderness; but there was this distinct swelling right below the tip of the mastoid process, and there was a general edema of the neck, extending to the median line. He had a temperature of 99° and a fraction. The man had not been well for some three months. The other aurist and myself believed he had a Bezold perforation. The radiograph showed the cells cloudy and the trabeculae broken down. We operated on the next morning. The incision was extended down lower than usual and opened up this abscess, which did not lead into the mastoid process. The mastoid was opened, the cortex was exceedingly hard and, having penetrated the cortex, we found the underlying cells filled with granulation tissue and pus.

There was no great amount of pus. The bone was very much softened. The cells over the jugular bulb were very soft, as also those in the angle between the middle and posterior fossae.

The operation was done before twelve o'clock. That night at midnight his temperature rose to 105° F. The next morning he had a cellulitis, extending well down along the anterior border of the sternocleidomastoid muscle; the temperature has remained high. The abscess cavity has been opened and followed down along the border of the muscle and as far as the sternoclavicular notch. I believe we have reached the end of the abscess cavity. He has areas of consolidation of both lungs. The temperature remains high—104° F. and more—the respirations are 48. The man is irrational to a certain extent, I suppose due to the high temperature.

I have never seen a case where the cellulitis developed so rapidly. I do not think the infection extends beneath the muscle, not that it has invaded the common sheath of the great vessels and the pneumogastric nerve. The infection is a strep-

tococcus hemolyticus; the blood culture is negative. The blood count showed over 6,000,000 reds, 81 polymorphonuclear cells and 29,000 white cells. The infection is very marked, much pus, with a very foul looking wound.

The question is whether, if we had not operated, he would have developed a sigmoid sinus thrombosis, as the bone was very soft over the knee and required exposure of the sinus at this point to eliminate the necrotic bone.

The induration the following morning was very marked, very hard and very brawny, more than half way down the anterior border of the sternocleidomastoid muscle.

DR. WELLS P. EAGLETON asked if it might have been gas bacillus infection?

DR. LEWIS: I do not believe so. The wound was very foul inside of less than twenty-four hours. We operated at one o'clock and the next morning at half past seven the edema and swelling was very marked and, when the neck wound was extended further along the anterior border of the sternocleidomastoid muscle, the area was found to be much infected, with much pus present.

DR. McCULLAGH: Was the skin discolored at all in the neck over the wound?

DR. LEWIS: The next morning it was.

DR. McCULLAGH: Was it red or dusky?

DR. LEWIS: Dusky.

Sinus Thrombosis.

DR. A. B. DUEL: In this case which I saw with Dr. Ward the mastoid operation had been performed, and in the course of a week following typical symptoms of septic sinus thrombosis developed, and it was decided to operate. The jugular vein was tied, the sinus was uncovered, and well back behind the knee, Galen's vein was uncovered. It was plugged off, the sinus opened, and a septic clot easily removed without great hammering. There was a very nasty vein wall all the way down, which was cut away and left as open as possible. The temperature dropped immediately to normal, and for nearly a week we felt that the case was recovering, when again typical symptoms of septic sinus thrombosis appeared.

We began put the child under an anesthetic, uncovered the

sinus farther back toward the torcular, found that the vein wall had infected the clot; the clot was subsequently broken down and again delivered through the torcular end. On the second operation the sinus was plugged off probably not more than half an inch from the torcular, and all the clot removed. The temperature then dropped, and apparently the case was cured for nearly another week, when again the symptoms of septic sinus thrombosis appeared.

The third operation, which was considered a very desperate one brought up a grave question as to whether we should simply remove the septic clot and plug off at the torcular, or what could possibly be done to get to an area of the sinus wall which was still healthy? We felt if we used an ordinary plug, and still left a healthy vein wall, that we would possibly encroach on the torcular to the extent that we would produce a clot within the clot. So we decided to uncover the whole torcular so that we could see the outline of it, and try to plug it off without interfering with the circulation coming from the longitudinal sinus and from the other one. The question of how we would possibly do that with the smallest kind of a plug was discussed. So I said, "If we could take the smallest tube and carry it out with a little bulb around the end of that clot and push it down there, we still would have plugged off the torcular without having interfered with the other veins which come into it."

At the suggestion of Dr. Ward, I used the smallest rubber tube, inserted a silver director or probe and cut it off and slipped it under the bone at one end and under the bone at the other end and tied it off. Having removed our septic clot we got the whole thing out. We tried it two or three times; we lifted the thing and let it bleed two or three times, and finally we found we could control it perfectly. We left it there, and were fortunate enough to have the case well again in a short time. It is now about five or six weeks since that happened.

DR. LEWIS: How long did you leave the tube in?

DR. DUEL: It was left there for a week. It was removed under anesthetics; no pain.

As this little narrow rubber tube with the silver probe did it perfectly, I intend, if I do any more sinus cases, to plug

the sinus with a small rubber tube, with a little silver wire in it, or something stiff of that kind, rather than to use gauze.

DR. T. P. BERENS: You mean compressing, not plugging, don't you? You compress your sinus, you stop the bleeding by compressing and not plugging.

DR. DUEL: Yes.

DR. BERENS: Crosswise?

DR. DUEL: Just as you always do, only when you do it you use gauze instead of this tube.

DR. BERENS: Which side was it on?

DR. DUEL: Left.

DR. J. G. DWYER: I saw this case of Dr. Duel's. The interesting part of it was the fact that he kept at it, with the blood picture suggesting sepsis all the way through. The child seemed to be gone day after day, but he had the nerve to go back to the torcular end and finally he just turned the tide. Everybody practically had given the child up.

DR. J. R. PAGE: Dr. Duel may recall my speaking to him of a similar case I had in Norwalk, Conn., which was operated on by me four times, the thrombus reformed four different times until the torcular was reached. I was surprised to hear it was on the left side—they seem usually to occur on the right, which is the larger sinus in about, I think, 70 per cent of cases, as it is a continuation of the larger longitudinal sinus in this percentage of cases, the left being a continuation of the smaller straight sinus.

In this case I got back to the torcular and put an iodoform gauze plug into the lumen of the vein, and I felt much disturbed for fear that I had interfered with the circulation on the opposite side. In looking up the literature, when reporting the case later, I found there had been an interesting discussion by Mr. Balance and Mr. Hugh Jones of the Liverpool Eye and Ear Infirmary on the subject. Mr. Jones maintained that enough attention had not been given to the extension of thrombi to the other side of the torcular—that is, to the danger of the thrombus at the torcular going across and involving the opposite side. Mr. Balance spoke, on the other hand, of the anatomic situation there as a safeguard against this very thing, as the right longitudinal sinus in about 70 per cent of the cases is a continuation of the longitudinal sinus,

and the left a continuation of the straight sinus, with sometimes no communication between the two at all, and usually a communication across the front of the torcular in the shape of a short sinus. The confluence of the sinuses usually described in the textbooks that we had in school is the exception. That is about as exceptional almost as when there is no communication between the two, I believe.

The "sinuum confluens" is almost as exceptional as an entire separation of the two sides. There usually is either a small aperture, or a short sinus across the front of the torcular. I remember distinctly, after removing the clot at the torcular, there was a sudden gush of blood, which was promptly controlled when I stuck my index finger into the lumen of the vein. I could then feel an aperture of communication with the opposite side. Now, whether this was an aperture into the straight sinus, or into the small connecting sinus, I don't know, but I just took a piece of gauze and stuffed it in there, and the patient got well.

DR. CHAS. E. PERKINS: I have dissected this region in a considerable number of cadavers, and I have never seen the large dilatation or confluence of the sinuses, but I never saw a case in which there was not a communication between the two sides. As Dr. Page says, the right sinus is usually a continuation of the superior longitudinal.

DR. ROBERT LEWIS: I had a case, a young girl who had had a tubercular history. She developed a mastoiditis. Shortly after the operation she had chills and all the signs of a sigmoid sinus thrombosis. I removed the internal jugular vein and opened the sinus and found a clot in it. Her temperature, instead of going down as is usually the case, shot up very high. A few days later I reentered the wound and found a clot near the bulb, which I removed. But her temperature still kept up. The temperature remained of a septic type for a good many weeks—from 97 up to 106 degrees F., always preceded by a chill. She developed abscesses of both axillary glands. They were opened.

The blood culture showed 110 colonies in 15 cc. of blood. At the end of two weeks and a half we gave her transfusion of 800 cc. of blood. Her temperature went up immediately after transfusion, and kept up for some little time after that.

A week later we gave her a second transfusion, the temperature came down and she commenced to get well. She is now well and the wounds practically healed.

The history of the case ran over a period of four weeks. She also had some consolidation of the lungs.

THE CHAIRMAN: Do you ascribe the final recovery to the transfusion.

DR. LEWIS: I think so, although the first transfusion was not given until the temperature had fallen a little. And then there was a recurrence of the septic temperature. But following the second transfusion there was a decided change for the better.

DR. WELLS P. EAGLETON: What form of transfusion did you use?

DR. LEWIS: The syringe was used to transfer the blood from the donor to the patient.

THE CHAIRMAN: Dr. Page, have you something that you would like to bring up?

DR. J. R. PAGE: No, Mr. President.

DR. CHAS. E. PERKINS: Speaking of the gas bacillus infection of the mastoid, several years ago I had a patient who I thought at operation had that infection. It was a patient who died of meningitis. He had postauricular edema which had developed during the previous twenty-four hours. There was no crepitation, however, in the edema over the mastoid, but when I incised down to the bone there was a whistling escape of air—that is, an escape of air with a whistling sound. The very careful bacteriologic examination made by Dr. Dixon, both of the discharge from the mastoid wound and also from the brain later, however, failed to show any germs to which he could attribute that formation of gas. I have never been able to explain why that should have formed there, and I thought I would bring that matter up at some time and find out whether it was as unusual an occurrence as it seemed to me at the time.

CHAIRMAN: Have any of the gentlemen had any like experiences?

DR. J. G. DWYER: I have seen two cases of gas bacillus of the ear. One was a case of Dr. Carter's. I was just asking Dr. Perkins whether the typical gas bacillus had been identi-

fied in this case. We believe there are a whole lot of organisms belonging to the gas bacillus classification. There are a whole lot of cases reported of wounds during this war where the gas bacillus set up infection. The majority of these cases died.

Incidentally, the Welch bacillus exists without causing any infection whatever. It only seems that when it gets beyond balance that it causes any trouble. The big question now is somehow to classify them.

CHICAGO LARYNGOLOGICAL AND OTOLOGICAL
SOCIETY.

Meeting of April 7, 1919.

THE PRESIDENT, DR. ELMER L. KENYON, IN THE CHAIR.

Froelich's Syndrome.

DR. GEORGE W. BOOT presented a boy aged twelve years who had a suppurating ear. The patient had been in the Cook County Hospital for treatment of measles. The boy was fat and pudgy and the fingers and toes were very short. He had the typical configuration of the female. No pubic or auxiliary hair. Dr. Boot suspected a mild case of Froelich's syndrome. There was no enlargement of the sella turcica. The visual fields were narrowed. The patient passed 1,560 cc. of urine in twenty-four hours. A test for sugar tolerance had been requested but had not yet been made.

Dental Broach in Trachea.

DR. G. W. BOOT: The patient was a lieutenant in the Medical Department at Camp Custer, who had a foreign body in the trachea. A dentist in working on the teeth used a broach which slipped and went down the trachea. It was located by means of the X-ray examination, and it was very easy to do a bronchoscopy, which was finished in ten minutes. (X-ray plate was exhibited which showed the location of the foreign body in the right bronchus.)

DISCUSSION.

DR. J. HOLINGER said that all suppuration in the middle ear had stopped, but about once a week there was a temperature of 102° which lasted for about a day and then went down to normal. There was still a question as to whether there was sinus trouble and that was being investigated.

DR. NOAH SCHOOLMAN presented his thesis entitled
**Contribution to the Etiology of Peritonsillar Abscess:
 Dental Origin.***

DISCUSSION.

DR. ROBERT SONNENSCHN said that he had seen a case in the last few months which illustrated many of the points described by Dr. Schoolman. A man of forty had trouble with his last lower molar, but despite the advice of the dentist the tooth was not extracted. The patient shortly afterward had sharp, severe pain together with the trismus described, with fever and a swelling pointing toward the angle of the jaw. There was great difficulty in opening the mouth, as there were no teeth missing, but by means of a long dressing forceps he was finally able to open it. An enormous amount of pus was evacuated and the abscess continued to drain for six or seven days, with eventual recovery.

DR. NORVAL H. PIERCE thought Dr. Schoolman had presented an important subject that had been very little talked or written about. He recalled cases where it was very difficult to make a differential diagnosis between paratonsillar and peritonsillar abscess, one particularly where the trismus was so great that little or no examination could be made. The abscess finally broke and the diagnosis was made after the man was relieved. These cases might cause very grave conditions, even threatening life, for they might be accompanied by profound sepsis. A case following extraction of an impacted wisdom tooth seen at Michael Reese Hospital had such a severe trismus that the abscess could be reached only with great difficulty. In that case there was very profound sepsis, and even after evacuation of the pus there were symptoms which proved that streptococcic infection had been well distributed through the body. He thought the subject would be kept more prominently in mind than it had been in the past on account of this very timely paper.

The subject of trismus was very interesting. They often found it in France accompanying slight wounds of the muscles of mastication. For instance, a soldier might come into the

See page 59.

Head Hospital from some other base or evacuation hospital with a very small healed wound in the cheek, and yet the jaws would be so firmly locked that he was fed with difficulty. X-ray examination would disclose a small bit of projectile lodged in the masseter, perhaps only as large as the lead on the sharpened end of a lead pencil. Parenthetically, it was not always easy to remove these foreign bodies after the wound of entrance had healed. The proper way to remove them was to operate under the fluoroscope controlled by the trained observer, watching the foreign body, the operator being directed in his approach by the observer. The scar tissue in which the foreign body was encased was removed together with the foreign body. Some cases would relax somewhat under deep anesthesia but not all. He had seen the jaw relax immediately after removal of the foreign body so that two fingers could be inserted between the teeth, which before had been approximated firmly. The nature of the trismus was not by any means thoroughly understood and needed to be further investigated. Possibly an allergic factor was involved. It was suggested that trismus might be an important point in the differential diagnosis between the two kinds of abscesses under discussion.

DR. ROBERT GOOD said, regarding the etiology of peritonsillar abscess, that some ten years ago he studied a few hundred tonsils with Dr. Orndoff, and in the examination they found many mucous glands in the capsule of the tonsil and found ducts leading from these mucous glands to the epithelium and then through the stomata between the cells into the tonsil crypts. Many of these mucous glands showed areas of degeneration. Some had fibrous tissue showing healed conditions of inflammation, and in others there was inflammation and degeneration of the glands themselves. It was clear to him that a peritonsillar abscess might be caused by a cryptic infection passing through the stratified epithelium of the crypts into these mucous ducts to the mucous glands, producing a pus infection in the latter, which ruptures and breaks through the capsule of the tonsil, forming a peritonsillar abscess. He was satisfied that this was one cause of peritonsillar abscess. This also explains why a peritonsillar abscess so frequently follows acute follicular tonsillitis.

DR. H. L. POLLOCK said that several things occurred to him as he listened to this valuable paper. He asked if Dr. Schoolman had ever seen any of the cases in tonsillectomized patients. This was an important etiologic factor. They very often found bilateral peritonsillar abscesses which were known to be of tonsillar origin. He had recently seen a case in which the dentist had been manipulating the last lower tooth on the left side. The patient was a man of forty-five and he had been treating him for several days. Trismus was so intense that he could not make a satisfactory examination but he made a diagnosis of peritonsillar abscess. The patient was sent to the hospital for X-ray examination and possibly an anesthetic to see if he could not be relaxed. In the afternoon the abscess broke and the man could open his mouth so that an examination could be made. There was no question about its being a peritonsillar abscess of dental origin. The most important feature of the case was the great amount of trismus. The diagnosis had to be made almost entirely by exclusion; this was very difficult and in some cases one had to go in blindly. He knew in this case that an abscess was present because of the temperature and swelling. He always did as Dr. Sonnenschein did—took a blunt forceps and opened the abscess, and it was remarkable to see how quickly the trismus disappeared. He had found, however, that these cases took a much longer time to disappear and heal than the ordinary tonsillar abscess. In two cases the pus escaped for a long time before the abscess healed sufficiently for the molar to be extracted.

DR. A. A. HAYDEN stated that some years ago he officed with a dentist who made a specialty of teeth extraction. Cases were frequently referred to him in which a difficult extraction had been performed—such as the removal of impacted molars—with the patient complaining of sore throat and inability to open the mouth, at least not without a considerable amount of pain. He had only seen one peritonsillar abscess among these cases, but supposed that that one quinsy case was of dental origin. He thought that trismus was one of the earliest signs of peritonsillar abscess. A history of sore throat, inability to open the mouth except with increased pain, were almost pathognomonic symptoms of peritonsillar abscess.

Small abscesses were often hard to locate, and frequently were not opened as early as they should be. Occasionally an unsuccessful attempt was made to open them, pus was not found and the patient was not relieved. When pus was found and evacuated the trismus very rapidly disappeared.

DR. HARRY KAHN said that about two months ago he was called upon to recommend a surgeon for a possible case of lockjaw. During two weeks the jaws gradually became more and more locked, and when he was called in the patient could not open the mouth at all. On examination there was the trismus, temperature of 101° F., pulse 118 and the patient was in a profuse sweat. The mouth was almost totally closed and could be opened only enough to get in one of the Pierce tongue depressors. There was presented a bulging area over the left tonsillar fossa and well up on the hard palate. He thought the best plan was to make an incision, and the pus spurted out under great pressure. The trismus, however, persisted for almost ten days before the mouth could be opened widely. He believed that a piece of tonsil had been left, as the history had stated that the tonsil had been removed, but this was not the case; back in the jaw, however, they discovered a decayed molar. The remarkable thing about the case was the trismus, which came on slowly and remained for so long.

DR. ARTHUR M. CORWIN said that there were probably none present who had not seen inflammatory conditions in that part of the mouth, with or without abscess, and yet producing trismus. He had seen a number of such cases, for example, where the teeth had been extracted and a very great disturbance was set up as a result of digging into the bone, and the inflammation of the masseter muscle gave the very picture so well described by Dr. Schoolman. They had also seen peritonsillar abscesses not of dental origin which had produced trismus. He had seen extensive overlapping of the gum in the region of the last molar, with the tooth submerged, the part infected, with pus running out from behind it, and a large inflammatory area extending up the anterior pillar, extending to the side of the masseter and producing more or less trismus without localized abscess outside of the inflamed area around the tooth.

He thought the paper was excellent and showed much study and thought, but he wondered whether we should draw the differentiation too sharply as between the two terms, para- and peritonsillar. Personally he had preferred the word "paratonsillar," as it covered all sorts of conditions, whether localized to one small area or extending upward or downward, sometimes to the lower third, and pointing usually toward the front. It always seemed to him that they were "para"—near, not "peri"—around. He thought Dr. Schoolman would limit the term "para" to other abscesses notably of dental origin which did not involve the space between the tonsil and the constrictor, and yet trismus being a very definite symptom. To him it was simply a matter of degree of extension and involvement. It was not worth while to take issue with Dr. Schoolman, as both terms would cover abscesses near the tonsil.

DR. NORVAL PIERCE said that two of the speakers made him think he had not made himself clear regarding the extreme trismus in these cases. He meant that the extreme trismus which came on early in paratonsillar inflammation might be a very valuable differential point between para and peritonsillar abscesses.

DR. J. HOLINGER agreed with the other speakers that the paper was timely. It drew attention to an etiologic factor of peritonsillar abscess that possibly had been overlooked, but it is certainly not the exclusive etiology.

In treating this condition for several years, it had been his habit in peritonsillar abscess to advise general anesthesia and remove both tonsils. In doing this he often found that the tonsil was practically dissected by the abscess. The abscess spread in the capsule of the tonsil, and the moment he loosened the tonsil from the anterior and posterior pillars it was comparatively easy to roll it out into the mouth and snare off the base. A patient who had been septic for days would be found free the next morning. Another advantage is this: Quite often peritonsillar abscesses had to be incised from three to five times. As soon as one abscess was evacuated another formed next to the first, and it was often a question of several weeks before such a patient finally gets well. This is, of course, excluded after the tonsils are out. This proposition was not

so startling if one remembered how often separate and unexpected abscesses were opened in simple tonsillectomy.

DR. ARTHUR M. CORWIN said that Dr. Holinger might not have had any serious complications in the removal of tonsils in the cases of quinsy or para- or peritonsillar abscesses, but in cases of such extent, tooth or otherwise, where the effects might bring serious issue, he doubted if it would be considered good practice among surgeons and medical men, and in this specialty, to take out the tonsils and open up such a large area to pus from the peritonsillar abscess.

DR. J. HOLINGER, answering Dr. Corwin's objection to his method, thought that it was good surgical procedure wherever there was pus to open it up. It seemed to him that this would be a good plan to follow in peritonsillar abscess. For obvious reasons he would not use Sluder's method in these cases.

DR. ALFRED LEWY read a paper entitled

Operative Treatment of Chronic Suppurative Otitis Media.

The cases are divided into urgent and nonurgent. In the urgent class we put intracranial complications, including labyrinth and lateral sinus cases, general sepsis and acute exacerbations in general. In these cases the question is between watchful waiting and immediate operation. Operation sooner or later is indicated, but a good diagnosis is prerequisite to the decision as to the best time to operate. Diagnosis depends upon history, general examination, with special reference to facial expression, tongue, skin, bodily condition; examination of blood, urine, viscera and musculature, followed by neurologic, including fundus examination and Barany tests where applicable, study of pulse and temperature curve, and finally spinal puncture with cell count, chemical and bacteriologic investigation. Exploratory operation is justified for unlocated pus in the cranial cavity and when other diagnostic measures have been exhausted. The diagnosis takes time, and time is valuable, but error is fatal, and the percentage of recovery is certainly greater with the man who has his facts in hand and who knows when and how to operate.

In labyrinth complications, first determine if there is any hearing or response to static tests; during active symptoms

absolute rest in quiet dark room. In the event of endocranial complication immediate radical and labyrinth operation if labyrinth is dead. In acute suppurative labyrinthitis either course, immediate operation or expectation treatment, is fraught with danger, but I believe the course herein advised is the less dangerous. After acute symptoms subside, radical operation, plus labyrinth operation if justified by tests and operative findings. A live labyrinth should not be operated. If active symptoms, recent or present at time of operation, the Neumann operation is preferred. In the case of a dead labyrinth that has been symptomless for a long time, the question of operation thereon can also be determined by the operative findings. When the disturbance is not violent and merely due to pus retention in middle ear spaces immediate operation may be done.

In acute exacerbations of chronic suppuration I favor careful observation until acute symptoms subside as the safer procedure. Endocranial complication demands immediate operation. Also subperiosteal abscess requires operation, but the plastic must be postponed.

In the nonurgent cases the following factors are considered:

- (a) The probability of serious complications.
- (b) The amount of disability or discomfort caused.
- (c) The probability of cure by less radical measures. This includes economic conditions.
- (d) The effect on hearing, which may be worse but not better.

Most nonurgent cases are amenable to cure or good control by local treatment; all should have the benefit of a trial course of treatment.

Indications for operation are: Cholesteatoma; caries of temporal bone; fistula of mastoid or bony canal; strictures; recurrent granulation tissue; adherent remains of membrana tympani or malleus, especially when associated with marginal perforation; frequent headache, vertigo, general ill health; persistently fetid suppuration resisting all treatment.

Probability of cure: Fifty per cent or less have dry ears after operation. About twenty per cent are mucous membrane

cases; in these operation is needless and generally useless, except perhaps closure of tube.

Selection of type of operation: Ossiculectomy if necrotic process is confined to ossicles of aditus and attic, providing hearing is less than one meter for the voice. It has the advantage of local anesthesia and no period of disability. Contraindicated by labyrinthine or endocranial complications and not without danger to the facial nerve and labyrinth.

Modified radical: Heath's and Ballenger's modification preserve the annulus tympanicus, and require elaborate after-treatment. Stacke, Bondy and Blackwell remove outer attic wall, but all aim to preserve the ossicular chain and remains of the membrana tympani. They had their place, but it is not well defined, except Stacke, who says his operation is useful when the perforation is in Schrapnell's or posterior superior margin and is closed off from the eustachian tube. He claims it is useful even if the incus is destroyed. Some type of modified radical is indicated when the simple mastoidectomy will not suffice and hearing is still fair, especially in children; when both ears are to be operated upon the better one may be selected for this operation; in the epitympanic type Stacke's operation may be done; however, according to our own technic.

For all other chronic suppurations which require operation the complete radical is done, having first tested the labyrinth and searched for evidence of endocranial involvement.

DISCUSSION.

DR. H. L. POLLOCK said that he had been asked to read a paper on this subject and that Dr. Lewy was going to present the nonoperative cases. Everyone realized that this was of vast importance, and with such a large field it would be impossible to discuss the whole phase of it. The time had changed from very radical procedure of a few years ago to more conservative treatment. A number of years ago, whenever a patient presented himself with chronic running ears, very few questions were asked, but a radical mastoid operation was advised. Now very frequently it was found by conservative treatment cases could be cured and remain practically cured without surgical interference. In many chronic cases

with symptoms of endocranial complications surgical interference was required, but not necessarily immediately. He believed by careful watching and waiting the patient had much better chances than by immediate operation. He had seen many cases of labyrinthine symptoms in acute exacerbations disappear by conservative treatment. He thought it was contrary to all surgical procedure to preach opening such an abscess in an acute condition. Nature had walled them off, and by going in fatal results were more likely to occur. The same thing held true with sinus thrombosis; it was not necessary to operate with the first chill, but let them go until sure of diagnosis and that the case was progressing rather than limiting itself. He believed there was very little question of interference where the diagnosis of extradural abscess and cerebellar abscess following the acute exacerbations, the main thing was to be sure of the diagnosis and then operate. He thought the most important point was in the non-urgent cases. It was pretty well agreed that where there were endocranial complications and in the chronic cases what was to be done. His rule was after careful examination to tell the patient with the fetid odor that there were three indications: First, and most important, was the prevention of the endocranial complications. Second, was to attempt to secure a cessation of the foul discharge or change it from the foul to a nonodorous discharge, and third, to conserve as much hearing as possible. As to the time for operation, these three points must be kept in mind. Dr. Lewy believed that fifty per cent would stop discharging, but Dr. Pollock thought this was too large a percentage, that not more than thirty-five to forty per cent, or two out of five, would be as many as would be found and kept that way. As to the hearing, he thought this was very little better. There might be temporary improvement immediately following the operation, but as the scar tissue began to get thick and hard the hearing began to get less and within a year no improvement was noticeable.

The discharge in cholesteatomatous cases was persistent; he believed that in not one in one hundred of these cases which were operated the mass would not form again and discharge. They did occasionally get well, but very seldom.

As to when to operate on a chronic discharging ear, he

thought that before attempting to do a radical mastoid operation everything in the way of cleaning up the pharynx and nasopharynx was very important. Tonsils and adenoids should be removed, and this procedure alone in children who had had a discharging ear often caused the discharge to cease and the drum membrane to heal over. If any accessory sinus trouble existed this must be looked after. In cases where this had been done and the discharge persisted he believed in attempting a modified operation in a selected number of cases. If, specially in young children, there was bilateral complication it was almost criminal to do a double radical operation without attempting the modified operation, and where they were successful the hearing would improve.

He had reported several interesting cases where they had attempted a radical operation on one side and a modified operation on the other. Where they were successful the patient had almost normal hearing in the side of the modified operation and very poor on the other. The large proportion would not get well, and there was still danger of the endocranial complication, but in young children and adults it was better to take the chance and watch the patient carefully rather than make deafmutes of them.

Besides clearing up the nasopharynx and other things there were other measures. In the cholesteatomas nothing would effect a cure, but in cases where central or peripheral perforations of the drum occurred there was a chance by careful cleansing of the ear and vaccine treatment, treating the middle ear through the eustachian tube, flushing out the ear with antiseptics, using antiseptic powders, drying the ear, etc., it was surprising how many cures could be obtained. They usually devoted from six to eight weeks to conservative treatment. If after eight weeks' time the patient had not made much progress they considered it useless and resorted to radical operation. After the radical operation they found a mucoid discharge every time the patient caught cold. They called it "the third nostril," and in a great many cases had been able to stop the discharge by closing the pharyngeal end of the eustachian tube. He had ceased trying to close the tympanic end of the eustachian tube. In one case they used trichloroacetic acid, which closed it up very nicely, but the patient de-

veloped a facial paralysis, which cleared up after three or four weeks. He thought conservative treatment should be tried for a long enough time to see if improvement would not occur; if not, a radical operation should be done. The first thing was to prevent any endocranial complications; second, try to stop the discharge, and third, preserve as much hearing as possible.

DR. AUSTIN A. HAYDEN read a paper entitled

Hemophilic Type Hemorrhage—Treatment by Transfusion.*

DISCUSSION.

DR. H. W. ABELMANN said that he had encountered many queer experiences and surprises in the use of the biologic test for blood incompatibility. This test consisted in injecting diluted donor's blood into the vein of the patient.

Blood which was very incompatible or toxic could be recognized in a few seconds. Only a few drops of such blood would bring about a reaction in a very short time.

Not knowing beforehand just how toxic the blood was to begin with, the blood was diluted to reduce its toxicity. To further control any sharp reaction, the blood was injected a few drops at a time and repeated every few seconds. If no reaction followed after a lapse of from three to five minutes the blood was usable as far as its compatibility was concerned. This simple test had been a very important safeguard in blood transfusion work, as he had had no deaths or serious mishaps in nearly two thousand transfusions which he had performed in the last three and one-half years.

The item of special interest to him was admirably illustrated in Dr. Hayden's case, namely, that the donor's blood may contain the coagulating ability but may not transmit that ability or may not be of any benefit in stopping the bleeding when injected into the vein of the patient. In this case, the biologic test demonstrated the compatibility of the sister's blood and although containing the coagulating substance it did not have the desired effect in checking the hemorrhage. He had repeatedly observed this phenomenon in his transfusion work. That the coagulating substance was present in the donor's

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blood was evident from the history. The donor, who had undergone an abdominal operation a few months before, made an uneventful recovery. There was no history of hemophilia to be elicited in the family records. He had had similar experiences in treating chronic infections; using compatible blood without noticing any material improvement in the patient's condition. However, on procuring a new donor, also with compatible blood, the patient made prompt and permanent recovery. In Dr. Hayden's case they selected another donor when they found the sister's blood unsatisfactory. About a tablespoonful of the second donor's blood had entered the patient's veins, when the patient remarked, "Say, Doctor, I can feel my nose swelling. I think the bleeding has stopped," and this was the case. The speaker had observed the above mentioned phenomenon in many cases, and the more of such cases he saw the more he was convinced that the laboratory tests are not reliable enough or efficient enough to be entirely depended upon when transfusing blood.

The simplicity and practicability of his method of transfusion permitted of therapeutic and biologic tests which are easily carried out and which he believed would prove to be of great value in blood transfusion work.

DR. GEORGE W. BOOT presented a little instrument made of platinum wire bent into several loops. These were filled with the patient's blood. After waiting three minutes the first loop was dipped into water; if the blood all washed out of the loop the second loop was introduced into water, after waiting another minute, the third, and so on until a loop was found coagulated. If the blood did not coagulate inside of five minutes he thought best to postpone operation.

DR. ALFRED LEWY said that he was in the habit of testing the patient's blood by means of something similar to Dr. Boot's appliance, but he had operated cases in which the coagulation test by that method showed clotting required twelve minutes, and there were no bad results from the operation. In one case in which no clotting occurred in seventeen minutes he refused to operate.

DR. ROBERT SONNENSCHNIG thought that very often the bleeding time was more important than the coagulation time. For instance, in some cases where the coagulation was slow

the bleeding stopped very promptly, and vice versa; and it was true that if one knew the time it took the bleeding to stop after an injury, it gave a very good idea of the time necessary for the vessels to retract following operations. One could rest assured that the patient would not bleed much more after operations than they did at the time of an injury.

DR. NORVAL H. PIERCE said that the only reliable method, according to the most modern ideas, was to take the blood directly from the vein, never allowing it to come in contact with the skin, as from the skin chemical elements may be derived which change the coagulation time. The blood was placed in a test tube, and as soon as the tube could be turned upside down without the clot coming out the coagulation was complete. The time for a clot to form with this method was greatly prolonged over other methods. In any case when coagulation was retarded and operation on the throat or nose was necessary, the patient should receive preoperative injection of serum and a course of calcium.

DR. CHARLES LONG said that when preparing a paper on the tonsils for the Upper Peninsula Medical Society, he had been informed that Dr. Allen—then an interne of St. Luke's Hospital in Chicago—had done some original work on coagulation of the blood for the nose and throat clinic. He found the percentage of hemorrhages in individuals following tonsillectomy was greater in those persons whose coagulation was normal than in those whose coagulation period was higher or abnormal; therefore, it would seem that the coagulation of the blood outside the body depended upon a different cause than the coagulation in the living blood vessels.

DR. JOSEPH BECK said that in working among the wounded and seriously bleeding patients it had been a question whether transfusion of blood or other substance should be used. Three weeks previously, at a meeting of the British Medical Society, the sum and substance of four years' experience with the British Army was given, and practically all the men were agreed that a substitute for blood which effected improvement was to use a solution of gum. He left the details of the technic for a report of some cases which he wished to make after treatment by this method. They found that a gum that was soluble and not irritating when it entered the blood stream

served far better than the transfusion of blood itself. There was no chance of any unpleasant conditions as in cases where blood was taken from another individual. It had been found very useful in overcoming the anemia following the bleeding.

DR. NORVAL H. PIERCE said that he had quite a good deal of experience with gum mixtures, and that the men in Vichy thought that gum was not nearly as good as blood, even in cases of shock. Of course it was very convenient, and the most of it had been used in cases of amputation following gas gangrene. His personal knowledge was that it did not seem to have any effect in these cases. Gas gangrene was a frightful condition, and the pathology of the disease would preclude all likelihood of a transfusion doing any good. There was no more effect from the transfusion of human blood. His impression was that the most beneficial material for transfusion was blood in all other kinds of cases.

DR. J. HOLINGER reviewed the characteristics of hemophilia and stated that shortly before the war Prof. Sahli, in Bern, and Fonia, an assistant of Kocher, did some very interesting work on this subject. Sahli considers certain enzymes responsible for the lack of coagulability of the blood, but undoubtedly also the blood vessels are abnormal. Fonia thinks that a fibrinogen substance, a forerunner of fibrin, is in the blood and is brought to action by a substance contained in the blood platelets. It is set free by the destruction of the easily destroyed platelets. In hemophiliacs these platelets are scarce or entirely absent. To supply the ferment of the platelets he found the "coagulen," a substance sold in the open market, a styptic. Fonia insists that he can stop the bleeding of hemophiliacs, but others doubt it.

DR. JOHN A. CAVANAUGH stated that it was necessary always to test the blood of the individual whose blood was to be injected into the patient. In one case he had examined the blood of six persons and mixed it with the blood of the patient and found that it destroyed the corpuscles of the blood so it could not be used. The seventh person came along and it was found that his blood could be used. He always made this test before performing a transfusion and considered it very important.

DR. E. P. NORCROSS stated that he usually had his patient's

coagulation time checked before a tonsillectomy. Usually those who coagulated very promptly bled more than those who did not. He thought it made little difference, but most of the patients were educated up to what should be done, and if the coagulation time was not taken they were apt to ask why it had not been. If there was no history in the family of a bleeder he was not very much alarmed about the case.

CHICAGO LARYNGOLOGICAL AND OTOLOGICAL
SOCIETY.

Meeting of May 5, 1919.

THE PRESIDENT, DR. ELMER L. KENYON, IN THE CHAIR.

Forceps for Ligation of Vessels After Tonsillectomy.

DR. JOHN A. CAVANAUGH demonstrated an instrument for ligation of bleeding vessels following tonsillectomy. The instrument was similar to the artery forcep. On one arm which is perforated is a groove for the passage of a catgut suture. On the other arm is a needle which passes through the perforated arm and picks up the suture and buries it below the bleeding point.

Perforation of the Mastoid Cortex.

DR. NOAH SCHOOLMAN demonstrated a patient who had suffered a perforation of the cortex.

DISCUSSION.

DR. NORVAL H. PIERCE asked where the perforation of the cortex took place.

DR. SCHOOLMAN replied that the perforation was about 1 cm. from another perforation in the posterior wall.

DR. PIERCE said that the point of perforation of the cortex in mastoid disease was important inasmuch as perforation occurs in simple suppurative processes along blood vessels. These blood vessels perforate the cortex from the periosteum and anastomose with blood vessels coming from the antrum. If a perforation occurs outside of this domain one must think of some disease other than the acute inflammatory processes, for instance, tuberculosis, cholesteatoma, etc., so it was always important to note just where perforation occurs. If it was along the path of the blood vessels, in all probability it was a case of simple inflammation.

DR. J. HOLINGER thought the interesting point about the case was that the boy had a complete loss of all the reflexes, and they

all came back after the shell which was shown in the X-ray plate was trimmed. The vision of the eye was almost gone, but had returned to practically normal. There was absolutely no reflex to light before the operation. Both pupils were slightly dilated and absolutely immobile.

Dr. Holinger demonstrated the following two cases:

Anomaly of Pharyngeal Vessel.

Case 1.—A woman of forty-eight came to the dispensary of the Cook County Hospital on account of headaches and a discharge from her nose. At the examination pus was found on the posterior end of the middle turbinates and in the nasopharynx. In the pharynx the following anatomic anomaly was incidentally discovered: The whole region of the right posterior pillar showed a broad, flabby pulsation extending about 1 cm. medial from the posterior pillar under the mucous membrane of the posterior wall of the pharynx from the base of the tongue to behind the soft palate. The margin of the pulsating area was sharply defined by a straight perpendicular line. It was evidently a large blood vessel immediately under the mucous membrane, but what vessel? The internal carotid is round, tightly filled and not flabby and flat like this. The posterior pharyngeal artery is not as wide and not flabby. It evidently was either an aneurysm of the posterior pharyngeal or an abnormal vein.

Extensive Ethmoid Cell.

Case 2.—The patient was a man of twenty-two, who came to the Alexian Brothers Hospital four weeks before, very sick. The left eye protruded widely out of its socket and he could only count fingers. He had headaches. The whole condition had developed within the week or ten days. Dr. Abel found the conjunctiva of the left eye red and swollen, the pupilla blurred. Dr. Heym (neurologist) found all the reflexes absent. On examination of the nose the mucous membrane was red and swollen, and pus was found in small quantities in the middle meatus.

An X-ray picture showed the left frontal sinus slightly cloudy, and below it a large flat ethmoidal cell extending nearly over the whole nasal wall and a part of the roof of the orbit.

A narrow elongation extended as far as the floor of the orbit. Through a Killian incision this cell was reached from the outside, the eye pressed downward and outward. All the tissues of the orbit were very hyperemic, but nowhere could large quantities of pus be found. The frontal sinus was opened and found to contain no pus; the lining was swollen. The cell was freely drained into the nose. The mucous membrane was very much swollen. The patient improved rapidly. There was still some swelling of the conjunctiva of the lower lid, but the exophthalmus had entirely disappeared and the vision was improved.

DR. ROBERT GOOD presented two cases with extradural irritation, following which he presented a paper entitled

Extradural Irritation and Abscess.*

DISCUSSION.

DR. C. C. ROGERS said that it was with a great deal of embarrassment that he came before this society to talk on extradural lesions when the members all were so familiar with the subject, but he thought there was no subject of more interest than this one and he knew of no condition that produced more disastrous results when the cases were neglected. He had been working with these cases for a number of years, and he thought that with the help of specialists in this line they had been able to accomplish something which he believed would be of benefit.

Dr. Good had spoken of the dura mater, and he thought it was well to consider it in two layers, as he said, but in extradural lesions it was only necessary to consider the outer layer, which was a true periosteum, and which was not at all different from the periosteum of any other bone. Those cases that were infected from the sinus to the dura mater produced an irritation of the periosteum, and he believed they should be treated in no other way than they were treated by general surgeons if there was an infection of the periosteum of any long bone. He believed it was the custom where there was a suppurative periostitis, whether there was free pus present or not, the thing to do was to relieve the tension. This pro-

See page 54.

cedure stopped the stripping of the periosteum from the bone, the destruction of the bone and the extension of the disease into the medullary canal.

If we have a subperiostitis of the tibia and cut down to the bone and relieve the tension in that way, then why should not the men in this specialty, when they have a patient diseased with periosteum in the cranial cavity which produces the symptoms which Dr. Good had shown and where there was a much more important structure on the distal side of the periosteum than on the proximal side of the periosteum on the tibia or any of the long bones, why should not the tension be removed? The only way this could be done is by lancing, and this is done in the same way as if we had to go through the tibia from the proximal side to the distal side. Go through the periosteum in the way of the least resistance. In these cases the only way that he thought the periosteum should be drained was by taking out a piece of skull and leaving it out. There was no necessity of trying to replace the bone or do a transplantation. The tension should be removed. The cranial cavity, as Dr. Good said, had just enough material in it to fill it completely. Anything added to it caused tension, and one of the most sensitive structures in the body was the dura mater. When that was irritated symptoms manifest themselves. The important thing to him was that the specialists in this line should recognize these conditions before the process had gone into the periosteum, into the inner layer of the dura or into the subdural space, or even further.

He knew that no member of this society had ever called him in consultation for a neglected condition, but he had seen at least fifteen cases of neglected mastoid conditions and two or three sinus cases where the process had gone through the periosteum and formed abscesses in the temporosphenoidal lobe. The fatalities in these cases are great, especially if it is an acute inflammatory process. It was just about as well to let a patient die without an operation, but it seemed to him that somewhere along the line someone erred. He talked plainly, as he saw it. This specialty had faults the same as general surgery. All a person had to do to become a specialist in this branch was to put the word in front of his name and a gold lettered sign on his door, and the patients

did not know the difference between the members of this society and those who simply put the specialty on their card. It was hard for the public to know where they were, whether they were in the proper hands or not. He thought it was the duty of this society to be a school in itself. He believed that there would be some way to know whether a man was a real specialist in any line, because the responsibility is great. Long before they saw the neglected case this damage was done, and they were trying to work against great odds and the results usually were not very good. He believed there was no reason why a case should die from a mastoiditis any more than from an appendicitis. It was no more difficult to operate, if taken in time, than a simple appendicitis. But if it had gone through the dura to the brain then it was a serious complication and a serious condition, and he believed that it was up to the specialists to educate the general physician; and he had all the respect in the world for the general practitioner, for he had the hardest job of any of us. He saw these cases, and it was difficult for him to do what general practitioners did and keep abreast with the times. He believed it was the duty of the men of this society to go into every branch society, every county society in the state and teach their specialty and educate these men. They could be taught as much in an hour as they would learn in a month reading a journal. They would come and listen, but they would not read the journals and would not understand what they read if they did, and in a good many articles there was not much to understand anyhow.

With the symptoms that Dr. Good had shown, if these cases were not recognized in time it was the fault of the physician who saw the cases. He saw case after case of **extradural abscess** that should have been operated before the abscess formed. It was not necessary to have a lot of pus to have all the symptoms that had been pointed out; they manifest simply an irritation to the dura, and the slightest increase in the contents there produces pain.

One other thing that he saw time after time, and that was that about one out of every three or four of these cases of extradural abscess or brain abscess had had a lumbar puncture. That would not tell a single thing in an extradural abscess; it would only do harm, and the patient had had a

damage done by having a lumbar drainage to relieve pressure. They should not be done—there was no excuse for them, no more than in an extradural hemorrhage. They were of no use in extradural hemorrhage, because if the blood pressure is 180, the cerebral spinal pressure 180, and one draws off the spinal fluid that decreased the intradural pressure and had nothing to do with the extradural pressure except that the extradural pressure would equalize itself a little more by stripping the periosteum a little farther from the skull, and that increased the abscess. Within a few hours the intradural pressure was the same as before, and all that had been done was to increase the abscess.

DR. GEORGE BOOT took issue with the speakers on four points. First, the vascularity of the dura. He had exposed the dura many times and had not found it to be a vascular membrane. In fact, it is quite the reverse.

Second, that extradural infection always preceding sinus thrombosis. Sinus thrombosis frequently occurs without there having been symptoms of extradural irritation.

Third, that some brain abscesses are too severe for operation. This he did not believe. He operated on three brain abscesses during the year preceding his entrance into the war and all recovered. Two of them were unconscious when first seen by Dr. Boot.

Fourth, the danger of doing lumbar puncture. It is not necessary to drain all the fluid from around the brain and cord. Only a little is needed for diagnosis, and this little is of great importance in diagnosis of intracranial conditions. The removal of enough fluid for diagnosis is of little danger to the patient.

DR. ROBERT SONNENSCHN said in reference to the point that Dr. Good made that an infection from a cavity like the sinus might involve the dura and the intracranial contents without a lesion in the bone, he could corroborate. He cited the case of a young medical student whom he saw a few years ago who had developed a very severe acute frontal sinusitis with external swelling. He did an external operation, drained and packed it, and in a couple of weeks the patient was in condition to go home. Very shortly afterwards, without any preliminary symptoms, he had a chill and sharp rise in tempera-

ture. He believed that the point of entrance for the infection was at the site of the operation, in spite of the fact that there was drainage. The sinus was opened and the posterior wall exposed, with no macroscopic lesion manifesting itself; but on removing the bone and exploring the brain an enormous frontal abscess was discovered. The patient died.

Another point which he considered good was the intranasal drainage in acute cases. He had seen Dr. Good operate a few days before in a case of acute frontal sinusitis. He had always been taught that such operative procedures in the middle meatus in an acute infection were dangerous, as there was great likelihood of an acute meningitis resulting. However, Dr. Good assured him that he had operated on these cases and obtained good results. He did not know what the state of the patient was whom he saw him operate ten days before but he knew that he had operated a good many such cases.

DR. NORVAL H. PIERCE said it was difficult to know where to begin in discussing Dr. Good's paper, as it covered such an extensive field and differed so radically from accepted opinion. For instance, he thought everyone had regarded the dura as a dense, connective tissue, nonvascular and comparatively insensitive membrane. He had frequently put an exploring needle through the dura when the patient was in full possession of his senses and the patient had not complained of any pain whatever. The fact that it conveys large vessels like the venous sinuses and meningeal vessels did not warrant its being regarded as a vascular membrane in the commonly accepted sense of the term. He believed that Dr. Good had tried to make the subject too simple. A severe headache, produced by an inflammatory process within the cranial cavity that was in contact with the dura, was in all probability produced by an increase of the cerebrospinal fluid. That did not mean the arachnoid or the pia was necessarily infected by living organisms, but it meant that toxins were in contact with the tela of the ventricles, which produce an increase in the cerebrospinal fluid.

The matter of attempting to make a surgical law which would embrace the treatment of otitis of the long bone and periostitis, so-called, of the nasal accessory sinuses and the

mastoid was futile, because the endeavor was based on an erroneous concept. They were two entirely different propositions, anatomically, physiologically and therapeutically. In the case of osteomyelitis of the long bone there was produced a pus filled, softened cavity that had no access to the external world except through a spontaneously or artificially made exit, whereas in the accessory sinus of the nose and of the ear we are dealing with anatomic cavities lined with a pharyngeal secretory membrane which have natural openings for the discharge of their contents. Therefore, one could not apply the same surgical principles as govern the treatment of inflammatory conditions of the long bones to the operative treatment of inflammatory conditions of the accessory sinuses of the mastoid cells. To say that one should, given an acute inflammatory process, open the accessory sinuses of the nose or the sinuses of the ear, as you would perhaps open a periosteum in a periostitis of the long bone, was bad surgery, that and nothing more, because at the beginning of nearly every case of acute rhinitis or otitis media, probably in every case, involvement of the accessory cells of the nose or ear was present. To say that one should open the mastoid cells whenever they are involved in an acute otitis media would be to say that one should exenterate the ethmoid cells in every acute rhinitis. He did not believe anyone would advocate that. Nature must be allowed to go her way as far as possible; we can only aid nature and direct her by our surgical procedures. The one who went in and tried to take matters entirely in his own hands was riding to a fall sooner or later.

He did not believe, unless there was an extremely large collection of pus between the bone and the dura, that there would be very much change in the pulse rate unless there were other intracranial factors involved. He thought everyone who had had any experience at all had seen large collections of pus between the dura and the bone without producing any symptoms whatever from the beginning to the end, until they had come upon these large collections of pus accidentally, not suspecting them at all before the operation. When such symptoms were present, as the X-rays had thrown upon the screen, as a rule it meant very grave intracranial lesions. It meant that the process had gone away beyond the comparatively insensitive

dura to other portions of the cranial contents. He emphasized the point that Dr. Boot made that it was not at all dangerous to do a lumbar puncture—even in cases of brain tumor (and those were the most dangerous in which it was done), if proper precautions were observed. The lumbar puncture must be made for purposes of differential diagnosis. It would be erroneous not to elicit as many symptoms as one could in order to guide us in the proper treatment of such cases which at best present many grave and difficult problems.

DR. JOSEPH BECK was entirely in accord with the gentlemen who had previously discussed the paper. He thought that the paper was the best theoretical paper that he had listened to, assuming conditions to exist that had not been proven by any experiment or on the operating table. So far as edema of the dura was concerned, he was sure that it would require much more than merely looking at a small area to say that the dura was edematous.

Another thing was the extreme caution that had been given by a man who had had much experience concerning lumbar punctures. They had come to believe from experience that it was a great aid in the diagnosis of intracranial conditions, and they knew that they did not have to draw off large quantities of fluid and effect an abscess. He did not think it was possible to accept many points in the paper.

DR. OTTO STEIN offered two points that had some practical bearing. First, as to the sensitiveness of the dura. In operations about the hypophysis under local anesthesia by the intranasal route, one had a good opportunity to test the sensitiveness of the dura, and he had never yet, in the cases which he had operated upon, had a patient complain of the pain in incising the dura, or even in excising a large part of it as in cases of cysts. That would be a very practical demonstration of the nonsensitiveness of the dura when the patient was awake and fully able to interpret sensation.

Another point was the rather dogmatic statement made by Dr. Good as to the symptoms of extradural irritation, as he enumerated them, always preceding the intracranial complications of mastoid cases. He had seen cases recently in which none of these symptoms of irritation were present. None of them complained of any pain whatsoever, and still there

was found upon operation lateral sinus involvement of acute origin, with either perisinus abscess or infected sinus thrombosis.

DR. ROBERT GOOD (closing) stated that he knew of a number of cases of frontal sinusitis where there was external dural irritation present, which he would report later. On exposed the dura by removing the posterior wall of the frontal sinus a half drachm or more pus was found, and immediately following that the patient was relieved of all symptoms. In the above mentioned cases the intranasal operation failed to relieve the extradural symptoms. To say that the dura is not a vascular structure he thought meant that they had forgotten their anatomy. In many cases, even in children, where one removed a plate of skull the vessels were as large as the lead in a pencil and much larger could be seen. Many times he had spent several minutes in stopping the bleeding when incising the dura, and the blood in the dura weighed about as much as the dura itself. To say that it had not much nerve supply, when the branches from the ophthalmic and the sympathetic and many others, as stated in his paper, supply the dura, it must be sensitive. Take, for example, a little spicula of bone sticking into the dura, the pain was unendurable. The dura was extremely sensitive to inflammatory irritants.

In regard to opening up acute cases, no one could tell him that when there was an acute inflammatory process in the sinus with the brain structure so near by, that because of this fact one should simply go to sleep and pray the Lord to take care of it. If one had an acute otitis media it was always opened early; why should one not open an acute infection in the frontal sinus which does not yield promptly under medical treatment? He thought that he was as conscientious as any other man about getting rid of a sinusitis without operating, but if the patient was lying in bed moaning and groaning he could not sleep at night and let that patient suffer. If his own son or daughter had an acute frontal sinusitis with the symptoms of vomiting and slow pulse and the other symptoms, he would not wait to allow complications to set in. He could open up the frontal sinus just as well as some other surgeon could open the abdominal cavity, only that on ac-

count of the brain tissues so near one should operate much sooner to avoid intracranial complications. He did not believe in the theories of letting the mastoid cases lie two or three weeks without getting well. He wished to have it put down as his opinion that he believed in opening up these cases early when they were not improved in a few days by medical treatment.

DR. JOHN A. CAVANAUGH presented a paper entitled

Submucous Correction of the Nasal Septum.

DR. CAVANAUGH advocated the elevating of the mucous membrane on the convex side of the nasal septum. He elevates the mucous membrane only on one side. When the tubercle is thickened or deflected he makes a groove below it with his septum shave, then introduces his blunt end double edged knife and elevates the mucous membrane on the opposite side over the tubercle and removes the tubercle with a biting forceps. When the bony part is deflected he breaks it over with his bone forceps, introducing the smooth blade on the attached mucous membrane side and the roughened blade on the bone of the side the mucous membrane has been elevated and fractures it, replacing same in median line. When ridges or spurs are present he elevates only on the convex side and with his septum gauge removes the obstruction. He packs only on the side the mucous membrane was elevated, leaving the pack in place for twenty-four hours.

DISCUSSION.

DR. ROBERT SONNENSCHN said he had that morning seen Dr. Cavanaugh perform this operation. It was very skillfully done and apparently very simple. The principle of the operation was one of conservation. By removing the piece of cartilage and leaving the groove, fracturing the crest and bringing it into the median line of the nose good breathing space was provided, as was demonstrated at the operating in the morning, where there was very little space between the inferior turbinate and the septum.

He could imagine that in some cases, such as were occasionally seen, if no modification of this technic was employed it might be a little difficult to get a large space at the internal

portion of the nose. He thought the operation was a very good one and that it would obviate the conditions they so frequently saw where practically all of the septum had been removed.

DR. E. P. NORCROSS stated that he also had seen Dr. Cavanaugh operate that morning, and as the Doctor had never seen the patient before he thought that it was a particularly good demonstration of the operation. He did not think that the Doctor removed one-third the amount of cartilage that the ordinary submucous operation took at the first cut, and he did not think that the entire amount of bone and cartilage removed in this operation was more than one-third of that amount. He thought it required more skill than the ordinary resection. There was no limit in the ordinary operation to the amount that could be taken out, but here one had to use a little more ingenuity in order to know where to make the shave.

Another point was the very slight pressure which the doctor used in fracturing the perpendicular plate. He expected to see him use a great deal of pressure, but before he realized that he was beginning he was through.

DR. ALFRED LEWY asked whether it was applicable to broadening and thickening of the maxillary ridge, and whether it could be applied to cases of thickening far back.

DR. H. L. POLLOCK said that he had the pleasure of witnessing the operation, and while he had never performed it, he thought that Dr. Cavanaugh had not taken sufficient time to make it quite clear how the operation could be applied to different forms of cases. In the case that he saw him operate on he had a very broad submaxillary ridge and he got rid of that by using a chisel. In this case it was broad on one side, and he simply dissected it down, after taking out the cartilage as was done in an ordinary operation, and then chiseled this maxillary ridge off. He thought that the operation had many advantages and that it was a very good conservative plan. He believed that with a little dexterity and skill on the part of the operator it could be made to fit every case. He realized that in most of the submucous operations too much material was taken away. In an effort to get at the thickening high up too much cartilage was removed, and this

operation did away with that and left the cartilage, and there was much less likelihood of perforation and also of hemorrhage. It was almost impossible to get a perforation. The only thing he thought was that the doctor did not remove enough tissue. Everyone knew that bone and cartilage would spring back if they left some in, when pressing the ethmoid region; one might think that it was not obstructed and that it was straight, but after it healed it would spring back and the patient would complain of the same difficulties as before. He had not seen the end results of this operation, but he believed that it was a very good practical one, although it required more skill than the old operation. If the little projections of cartilage would not spring back he thought the operation would be ideal.

DR. CAVANAUGH (closing) said that the operation was a simple procedure, but it was necessary for the operator to use his head. As far as the bulging part of the process which Dr. Pollock spoke about was concerned, there was absolutely none of that with this operation. That could always be overcome by placing the shave in the proper place, as illustrated by the cuts. This operation could be applied to a bulging cartilage anywhere it was found. It was not necessary to make the groove in any one place; it could be made where it was essential in order to get the flap back into the proper position.

As to the spur far back, Dr. Cavanaugh elevated the mucous membrane on the convex side, leading the tip attached to the mucous membrane, which he severed. He then put his chisel in front of the elevation where it began, and drove it through with a hammer so that the spur was removed. Where there were ridges on the floor the operation was performed in the same way. One of the illustrations showed the exposure on the opposite side; he removed a piece of cartilage at one point and elevated the mucous membrane and with his chisel cut away the obstruction, leaving the balance of cartilage in position. In the big bone deviations, it was only necessary to proceed as he did in the case operated upon in the morning. Dr. Cavanaugh said he was very glad to demonstrate the operation to anyone who cared to see it at any time.

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